



## ARTICLE

# Implication of Household's Income Composition on Infrastructure Maintenance in Residential Core of Akure, Nigeria

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### ABSTRACT

This study examines the implication of household income composition on infrastructure maintenance in the residential core of Akure, Nigeria with a view to providing suggestive recommendations that will remedy identified problems in the research locale. With regards to this, an estimated of 1% research population, amounting to 425, were served with questionnaires using systematic random sampling technique with replacement. Findings revealed that residents in the study area are low income earners with larger population influenced by market proximity, low prices of staple food items and affordable but tumbledown housing. Likewise, essential facilities are in poor state owing to poor maintenance. Besides, household income induced variables considered in the study, which accounted for 75.6% of the challenges limiting routine facilities maintenance in the study area. The study recommends skill acquisition training, resource collaborative efforts and soft loans scheme to boost the income generation of residents in this locale.

## 1. Introduction

Household income, in economic parlance, is contextually envisaged as receipts, proceeds or revenue that are received or generated by the household or individual members of the household at annual or more frequent intervals<sup>[1]</sup>. Household income, without any iota of doubt, is a handy empirical tool for investigating human wellbeing in his abode and material prosperity in a contemporary society. This is obvious in his housing stock, environmental vista and infrastructural facilities in his domain. It is pertinent to note from time immemorial till date that man in his quest to assume better income standing among his

contemporaries is on a passionate search for employment opportunities, education, and technological innovations among others. This resultant adventure had retrofitted into human membrane a stimulus for rural-urban drift as well as movement across transnational boundaries with a view to achieving goals and aspirations of economic prosperity. This has invariably brought to being rapid urbanization characterized with population explosion in our towns and cities with attendant physical planning implications.

The fact remained that urbanization on the positive flip heralds an environment that is heterogeneously composed and exponentially convoluted. This accelerates the coming together of urban populace of different tribes, religion and

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socio-economic posture with a common front of developmental activities in our towns and cities. This is even viewed from the perspective that cities are epicenter of economic density and productivity; thus, enhancing the positive benefits of firms locating in close proximity to one another <sup>[2]</sup>. In spite of this gains associated with urbanization in the developed world, the reverse is the trend in Nigeria and Africa in general with grave consequences occasioned by poor urban governance. Issues of urban structural transformation are not taken with seriousness by government at all levels; thus, culminating into inadequate job creation, poor infrastructural facilities, housing challenges, and access to basic services <sup>[2]</sup>. The effect of this mismatch between urban population and infrastructural facilities is devastating leaving urban infrastructure overstrained and in deteriorating condition calling for prompt maintenance attention.

Ogunbajo, *et al* <sup>[3]</sup> were quite categorical on this subject-matter when they averred that the carrying capacity of infrastructure systems to stimulate socio-economic development solely lies on its maintenance management. Conversely, infrastructural facilities are most often left unattended to, until it attained the state of deterioration in Nigeria <sup>[4]</sup>. This is unhealthy and an albatross to per capita development and poverty alleviation. It is pathetic to note that institutions of government responsible for infrastructure management in Nigeria had failed in this direction owing to dearth of funds and other systemic encumbrances.

In a bid to arrest this ugly development in her infrastructure sector, the federal government in 2005 enacted Infrastructure Concession Regulatory Commission Act (ICRCA) <sup>[5]</sup>. This was designed to allow for private sector inclusion in infrastructure management and thus conceded some of her critical infrastructure which include telecommunication, railway projects, electricity, and waste management, among others. While this strategy has yielded positive results in the telecommunication sector <sup>[4]</sup>, no meaningful achievements had been recorded in other infrastructure sectors. This unfortunate turn of circumstances had constrained households and neighbourhood; especially, in the urban setting to seek self-helps in making infrastructural facilities in their locale functional.

In the words of Yoade <sup>[6]</sup>, income is the primary determinant factor influencing household's decision on what part of the city to reside. Similarly, the level of infrastructure maintenance provided in any place of abode is a product of income. It is, therefore, from this insight that this paper tends to examine the implication of household's income on infrastructure maintenance in the Akure city core.

## 2. Literature Appraisal

Urbanization trend is a global phenomenon. The de-

veloped climes across the planet earth such as Europe, America, and the Caribbean are urbanized continents with about 75% of their population living in cities <sup>[7]</sup>. The fact remained that urbanization in developed nations has engendered high level of positivism in their developmental process. This is characterized by spatial distribution of human and material resources paving way for efficiencies in infrastructural facilities and services in these climes <sup>[2]</sup>. This, in no small measure, emplaces prosperity, higher education, lower fertility, and higher life expectancy in these developed regions of the world. Urban centres in these developed countries are product of spatial planning and not as a result of spontaneous development.

In an exclamatory remark on the trajectory of urbanization in Africa, UN-Habitat <sup>[8]</sup> pointed out that Africa is in a period of historic change in her demography. This astronomical increase in population in African countries is not at par with infrastructure requirements of her fast growing urban centres <sup>[9]</sup>. This lack of adequate and efficient infrastructure systems; especially, in Sub-Saharan Africa constitute a major impediment to socio-economic development as it stifles economic growth and inhibitor to poverty reduction across the region <sup>[8]</sup>. This could be attributed to the reason why poverty is on the increase in developing countries; especially, Africa where overwhelming majority of her population in the low income group are lacking the basic necessities of life <sup>[10]</sup>.

It is no longer news that Nigeria is in dearth need of infrastructure to grow her economy. In the estimation of the National Planning Commission <sup>[11]</sup>, about three trillion US Dollar will need to be invested over the next 30 years to provide and maintain adequate infrastructure in Nigeria. This remained a daunting task looking at the fact that oil prices in the international market is on the downtrend, occasioned by Covid-19 pandemic that put the country's economy at greater risk of recession for the second time over the space of four years after the 2016 economic meltdown. This calls for diversification from the monopolistic oil sector economy to agriculture, manufacturing and service industries which could only be achieved through investment in infrastructure.

Looking at the economic realities on ground and poor utilization of resources coupled with corruption during the period of oil boom in Nigeria, every tier of her government is incapacitated in their obligations of providing and maintaining urban infrastructure <sup>[12]</sup>. It is even sardonic to point out that infrastructure projects under concession such as electricity is in pitiable state with overwhelming majority of her population being subjected to frequent power outage. The bottom line of this discourse is a pointer to the fact that a nation cannot be rich without quantum

of adequate and functional infrastructure<sup>[5]</sup>. Thus, a once prosperous oil rich nation, as Nigeria, is now being infamously regarded as nucleus of poverty in the world.

This shackle of poverty had resulted into residents living in overcrowded dwellings with nonexistent or acute shortage of household and neighbourhood facilities typified by slum development as well as socio-spatial disorderliness<sup>[13-14]</sup>. This is even compounded by scarcity of white collar jobs and poor enabling environment for the informal sector economy to generate blue collar jobs for the teeming urban migrants. A study conducted by Brook and Smith<sup>[15]</sup> revealed that majority of Lagos residents live in shared apartment blocks with an average of seven persons. This set of occupants share the same latrine and small bathroom which is often located outside the buildings<sup>[16]</sup>. Taking into cognizance the rate of abject poverty in Nigeria, Bankole and Oke<sup>[17]</sup> was of the opinion that majority of her residents live in unhealthy and filthy environment based on their income levels.

The challenge of urban poverty characterized by poor infrastructure provision and maintenance is more precarious in the core of Nigerian towns and cities. These areas are not well laid out; hence, they are overcrowded and occupied by people of low per capita base. Houses in these environs are built without reference to acceptable planning standards. They are marked by high level of filth, crowding index and epidemics susceptibility<sup>[18-19]</sup>. Owoeye<sup>[20]</sup> argued that inhabitants of these old traditional residential districts are shrilly incapacitated by financial wherewithal in the routine maintenance of infrastructural facilities in their domain. Although, the blame of infrastructure decadence in these residential cores should not be apportioned on the inhabitants alone but also on government for neglect, policy summersault and social isolation of people in area of infrastructure management<sup>[21]</sup>.

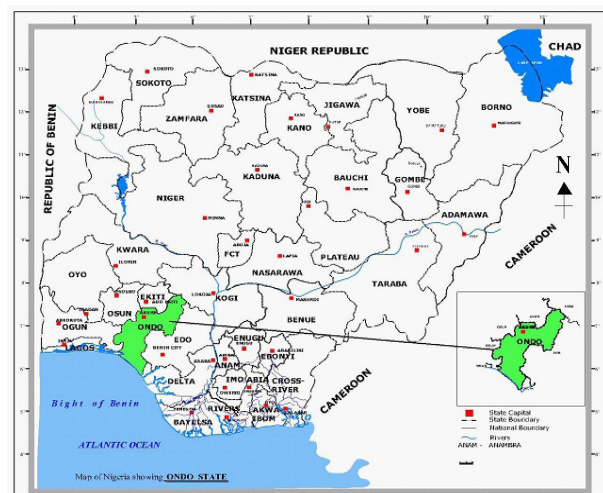
Generally speaking, higher income induces economic development which in turn manifest in decent housing and better infrastructural facilities<sup>[22]</sup>. According to them, the latter is a composite means for generating the former. This is mirrored from the point that stable power supply reduces the cost of production as well as creates an enabling environment for small and medium enterprises to thrive thereby creating jobs for the teeming unemployed urbanites. Good transportation and effective communication networks on the other hand saves travel time, reduces travel cost and, ultimately, facilitates trading activities which on the long run increases per capita development. It is from this viewpoint that this study sees infrastructure as dynamo for raising income and tool for addressing revenue inequality. Thus, its development provides an array of influential strategies for tackling urban poverty, which this

study intends to investigate as far as the residential core of Akure is concern.

### 3. Research Methodology

#### 3.1 Overview of the Study Area

Akure is a fast evolving city in the southwest geopolitical landscape of Nigeria. It is a home to number of tertiary institutions and commercial centres. Chief among these include the Federal University of Technology, Federal College of Agriculture, International Auto-mart Station, among others. Spatially, the city is located within latitude  $7^{\circ} 15'$  and  $7^{\circ} 28'$  north of the equator and longitudes  $5^{\circ} 6'$  and  $5^{\circ} 25'$  east of the Greenwich meridian<sup>[23]</sup>. The city is situated within the tropical rainforest of Nigeria where rainfall and humidity is high throughout the year. It is the administrative seat of Ondo State which came into being in 1976. The population of the city has witnessed incredible exponential increase, swelling from 353,311 in 2006 to an approximate 589,376 in 2020 based on a projection of 3.2% growth rate per year. The spatial extent of this research is limited to Akure residential core, as clearly defined in Figure 3. The choice for this part of the city was informed by high level of decrepit infrastructure occasioned by poor maintenance, low per capita development, resident's negligence and ineptitude<sup>[20, 24]</sup>. Seven out of the twenty-two neighbourhood in this part of the city were systematically chosen for this study going by their proximate arrangement and magnitude of infrastructural decadence. These include Imuagun, Odo-Ijoka, Araromi, Oja-Oshodi, Odo-Ikoyi, Isolo, and Obanla. Figures 1-3 showcase detail description of the study area from national to local context.



**Figure 1.** Ondo state in the national setting

Source: Ondo State Ministry of Physical Planning and Urban Development (2019).

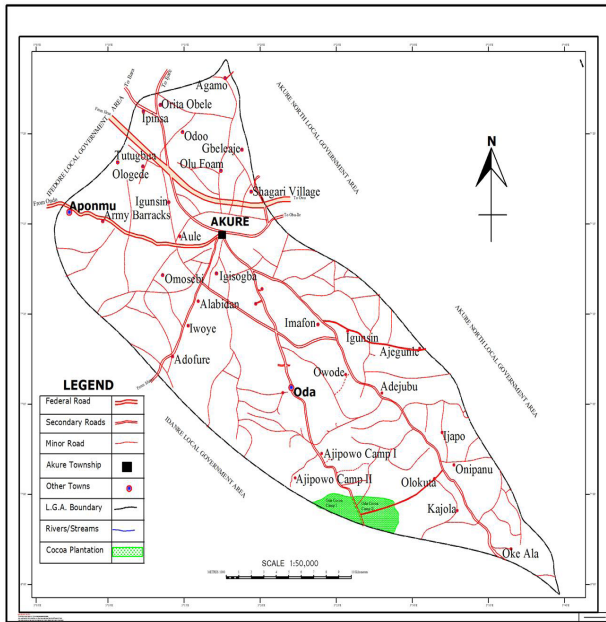


Figure 3: The Study Area in its Local Setting  
Source: Ondo State Ministry of Lands and Survey, Akure (2011)

Figure 2. Akure and its major settlements in the local govt. setting

Source: Ondo State Ministry of Physical Planning and Urban Development (2019).

### 3.2 Research Database

It is imperative to note that the population of the study area was unknown going by the fact that population censuses conducted from time immemorial in Nigeria were not disaggregated into neighborhoods. Thus, with a view to collect data scientifically from the research locale, building population survey was carried out using Google Earth and ArcGIS to arrive at 1696 buildings. The average household size in Akure city, according Ondo State

Bureau of Statistics [25], was put at five persons per family (5ppf) and five households per building (5hpb). Therefore, the estimated population of the research locale for 2019 was computed at 42,400 persons. Thus, a 1% of this estimated research population was chosen for questionnaire administration which is considered reasonable taking into consideration similar infrastructure maintenance challenges confronting residents in this locale as well as having homogenous socio-economic characteristics in an unvarying physical environment. These structured questionnaires were administered using systematic random sampling technique with replacement at the interval of twenty buildings. Retrieved questionnaires were analyzed and interpreted using appropriate statistical tests.

## 4. Result and Discussion of Findings

The subjects of discourse to be analyzed and interpreted in this paper are income distribution of respondents, factors influencing residents to living at the core of Akure, condition of infrastructure in the study locale, relationship between household's income induced variables and level of infrastructure maintenance as well as implication of these variables on infrastructure maintenance.

### 4.1 Income Distribution of Respondents

Data retrieved from respondents in the residential core of Akure city, as elicited in Figure 4, revealed that 21.6%, 24.9% and 30.1% of residents in this locale received average monthly gross household income of between ₦20000 - ₦30000, ₦30000 - ₦40000 and ₦40000 - ₦50000 respectively. By the virtue of the Nigerian new minimum wage act of 2019 which was pegged at ₦30000 and the submission of ODSBS [24] that an average household in Akure urban is five persons, it could be argued that resi-

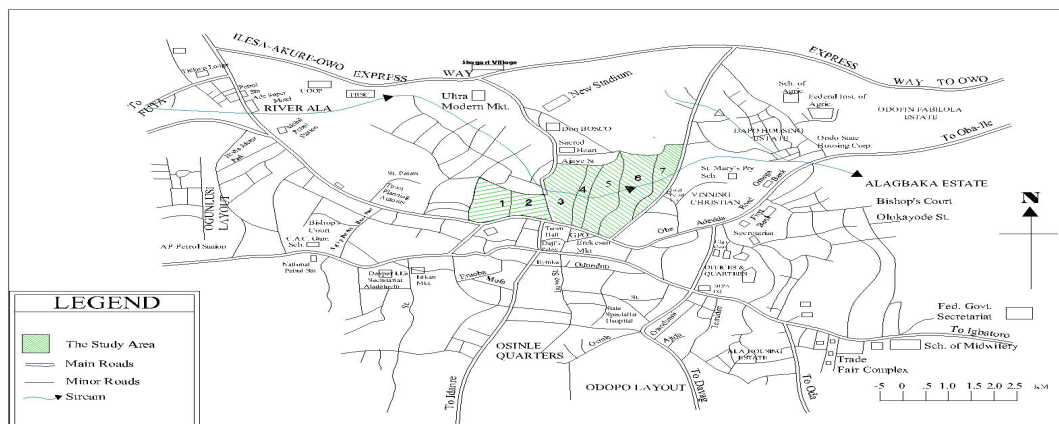
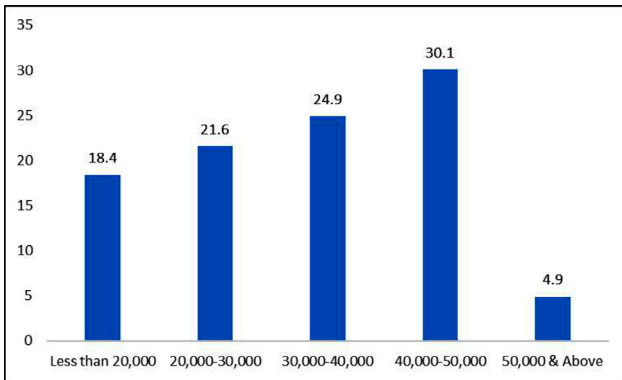


Figure 3. Akure Street map showing the research location within the residential core of the city

Source: Olasemojo & Owoeye [21].

dents in this study locale were low income earners living below the poverty line.



**Figure 4.** Percentage household income distribution of respondents in Naira (₦)

Source: Field Survey (2019)

This finding was in total agreement with the view of Rotowa *et al.*,<sup>[24]</sup> that the core of Akure residential neighborhoods was predominated by low income earners. It is in the light of the foregoing that Akinbamijo<sup>[19]</sup> counseled that any meaningful intervention designed to mitigate urban deprivation must address issues of substantial increment in income generation on the part of the marginalized urbanites.

#### 4.2 Factors Influencing Residents to leave in the Study Area

The variables designed to explore the catalytic factors influencing households to this part of Akure city were designed on a rating scale of five options, where: Strongly Agreed (SA) = 5, Agreed (A) = 4, Undecided (UND) = 3, Disagree (D) = 2, and Strongly Disagree (SD) = 1. These set of options thus served as the basis for establishing agreement, indecision and disagreement with respect to the subject-view. In the course of this survey, it was revealed that housing in this locale was relatively affordable and cheaper when compared with the transition and peripheral zones of Akure city. As such, the poor urban households and rural migrants tend to settle in this area owing to their low income status. This was empirically proven in Table 1 with a mean mark of 4.03. Despite the fact that housing was relatively affordable; the issue of habitability was nothing to write home about. This statistical revelation was in tandem with the study of Owoye<sup>[20]</sup> on environmental habitability in this locale where he established that the problem of livable dwellings with minimum acceptable standards persists in the core of Nigerian towns and cities, with proven evidences in Akure

residential cores.

**Table 1.** Factors influencing households to Akure residential core

Factors	Means	Std.
Cheap housing	4.03	1.416
Proximity to market	4.13	1.387
Cost of living	4.23	1.281

Source: Field Survey (2019)

Proximity to market was found in the course of this research to be one of the principal factors influencing household’s decision to settle in the core of Akure city. This was evident in Table 1 with a mean score of 4.13. Clusters of markets, which include Akure Central Market, Isolo, Erekesan, and Adedeji markets among others in this locale availed these low income urbanites to make a living through petty trading, artisanal enterprises and menial jobs like truck-pushing, hawking, vending and so on. Akinbamijo<sup>[19]</sup> led credence to this finding when he empathized that these group of people live from day to day rather than working to secure a future. Similarly, data extrapolated from respondents showed that low cost of living as elicited in Table 1 with a mean value of 4.23 was a motivating factor influencing low income households to reside in Akure core. Observations and on-site investigation revealed that prices of staple food like garri, beans, vegetables and varieties of grains were relatively cheaper when compared to the transition and peripheral zones of the city. Thus, these set of low income earners tends to settle in these environs with a view to maximizing the comparative advantage of market proximity to their place of abode.

#### 4.3 Condition of Infrastructural Facilities in Akure Residential Core

The variable measuring this subject-matter was designed using a Likert scale of five options, where: Very Satisfied (VS) = 5; Satisfied (S) = 4; Fair (F) = 3; Dissatisfied (D) = 2; Very Dissatisfied (VD) = 1. It is not out of place to assume that road infrastructure provision and maintenance is not within the reach of average urban households because of huge financial resources involved. Thus, in most circumstances, the level of paved roads in towns and cities is a product of their government inter-

ventions. With regards to Akure urban core, data obtained from respondents and observations in the course of this survey all pointed to a verity that road infrastructure in this area was fair. This was evident in Table 2 with a mean value of 3.03. This was an indication that Ondo State Agency for Road Maintenance and Construction (OSAMCO) and the Direct Labour Unit of Ministry of Works and Infrastructure were up and doing in their statutory mandate though with a lot of ground yet uncovered; especially, as it relates to rehabilitation and renovation of certain portions of roads in the city.

**Table 2.** Condition of infrastructural facilities in the study area

Condition of facilities	Mean	Std
Road	3.03	0.797
Electricity	2.23	1.060
Water	1.84	1.062
Waste management	3.19	1.180

Source: Field survey (2019)

Electricity facilities and power supply, going by the submissions of sampled respondents, was worrisome. This was elicited empirically in Table 2 with a low mean score of 2.23 pointing to dissatisfaction on the part of residents in the area. It is momentous to note that electricity is one of the infrastructure sectors that had been unbundled and conceded to private investors. It is quite heartrending to note that this engine of economic development is not relatively accessible to low income households of Akure residential core. The plight of these urban poor is marked with arbitrary metering with exorbitant monthly estimated bills which is not within the purse of this set of people leading to regular disconnection, power outage and, ultimately, poor maintenance of electrical installations in their domain.

As also shown in Table 2, water facilities in the core residential neighborhood of Akure is in pitiable condition with a low mean mark of 1.84. It is even pathetic to note that due to current economic realities, institutions of government in Nigeria are constrained in their primary mandate of pipe-borne water facilities provision and maintenance. This statistical discovery was in consonance with the assertion of Macheve, *et al.*,<sup>[26]</sup> where it was established that 99% of water supply system solutions were

provided by households in Port-Harcourt. The resultant effect of this unwholesome development predisposes low income households residing in Akure residential core to the use of unhygienic water from unsafe sources which is pernicious to their health.

With regards to waste management, data retrieved from respondents showed that this element of discourse was reported to be fair with a mean score of 3.19. A cursory visit to this locale gave credibility to this statistical finding, which was contrary to existing literature on this subject-matter. Basically, the study identified low acuity of residents to waste disposal and non-functional of waste management authority in this locality as potent factors triggering apathetic behavior among the residents. It could be argued that this new development was informed by the concession of waste management activities to a private company called Zoon Lion Alliance Company with reasonable waste management bills which is not out of reach of low income households living in this locale. All the same, their functionality in term of regularity and effectiveness in collection is limited and very low compared with rate of waste generation.

**4.4 Household Income Induced Variables and Level of Infrastructure Maintenance Nexus**

Having established in Table 2 that electricity and potable water facilities were in deplorable state as a result of poor maintenance, it then became imperative to examine the link between household income induced variables and level of infrastructure maintenance. This is hinged on the fact that electricity and power supply is a private business administered by corporate organizations while potable water supply is more or less a household affair in Nigeria. Variables at play for household income induced elements, which serves as predictor variables are cost of maintenance and non-response to maintenance while the outcome variable is the level of infrastructure maintenance. These set of variables were designed on ordinal scale of measurement and, as such, were transformed using double-log transformation to assume approximate normality needed to carry out Pearson Product Moment correlation employed for this test. Results generated from this statistical test revealed that all the variables at play, with regards to the subject under investigation, were significant at  $P < 0.01$ . Going by the data in Table 3, it is crystal clear that there was strong positive relationship between cost of maintenance and level of infrastructural facilities maintenance with a correlation coefficient of 0.870. Likewise, there was strong positive relationship between non-response to maintenance and level of facilities maintenance.

**Table 3.** Zero order correlation matrix

	(Y)	(X <sub>1</sub> )	(X <sub>2</sub> )
State of infrastructure maintenance (Y)	1.000		
Cost of maintenance (X <sub>1</sub> )	0.870	1.000	
None response to maintenance (X <sub>2</sub> )	0.872	0.771	1.000

Source: Computer print-out (2019)

The significance of these findings was not unconnected to the fact that cost and response to facilities maintenance are influenced by income. Unfortunately, residents of Akure core are low income earners, who could hardly cover household feeding expenses let alone infrastructural facilities maintenance. This is clearly represented in Figure 4.

#### 4.5 Implication on Infrastructure Maintenance

It is evident in Table 4 that household income induced variables considered in this study, which are cost of maintenance and non-response to maintenance, revealed a correlation coefficient of  $(R) = 0.870$  and coefficient of determination  $(R^2) = 0.756$  with regards to level of facilities maintenance. This signifies that the model comprehensively accounted for 75.6% of the variance that could be explained with respect to household income induced variables and level of facilities maintenance in the core of Akure city.

**Table 4.** Regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.870	0.756	0.755	0.18405

Note: Predictors: (Constant), cost of maintenance, none response to maintenance

Source: Computer print-out (2019)

The resultant state of poor facilities maintenance; particularly, in electricity and portable water facilities in Akure city core occasioned by resident’s low income standing was obvious in their poor functionality, vandalism, theft, and premature deterioration. This has, in no small measure, subjected households in this locale to untold hardships ranging from small and medium enterprises development challenges to water-borne related epidemics susceptibility.

### 5. Conclusion and Policy Recommendations

In a nutshell, the binomial interplay between household’s income and infrastructure management has been

scrutinized in this study. The crux of this matter remained that these elements of discourse are indispensable. This is even viewed from the point that an improvement in infrastructure provision and maintenance will stimulate an increase in household per capita development and vice versa. It is pathetic to reveal in this study that households in this locale were low income earners who lack financial means to maintain infrastructural facilities in their domain. The predicament of these households was further worsened by government inability to fix critical facilities like electricity, waste management, water provision among others leaving her to no other choice than conceding them to corporate organizations. While substantial achievements are made in area of waste management, though not sufficient enough as revealed in this study; the functionality of electricity facilities, power supply and pipe-borne water was appallingly poor. The effect of this quandary on Akure core households is multifarious which include exorbitant electricity bills, power outage, vandalism, theft, and lack of potable water for household consumptions. It is in the light of this foregoing that the following recommendations are advocated:

(1) In spite of residents’ low income status, collaborations between neighborhoods in the core of Akure to provide and fix existing faulty facilities like pipe-borne water and electricity by pooling resources together would go a long way in addressing these aforementioned maintenance challenges.

(2) Corporate organization responsible for electrical installations, repair and maintenance should be alive to their responsibilities by making power supply available to households in the study area with a view to stimulating the growth of small and medium enterprises, taking into grasp the comparative advantage of the area being an economic hub of Akure city.

(3) Likewise, issues of outrageous bills beyond the purse of poor residents should be discouraged to prevent unnecessary confrontations that could precipitate into vandalism of few available facilities in the area.

(4) Infrastructure Concession Regulatory Commission Act (ICRCA) of 2005 should be stringently enforced and regularly reviewed to meet current realities while corporate organizations in charge of critical infrastructure be put on their toes for efficient service delivery.

(5) As a matter of urgency, government institutions like Nigerian Directorate of Employment (NDE) should incorporate low income households in their skill acquisition programs while Ondo State Microcredit Agency (ODS-MA) be ready to offer them soft loans for commercial purposes with a view to boosting their income generation.

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## Conflict of interest

Authors declare no conflict of interest.

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