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RESEARCH ARTICLE

Residents' Environmental Health Awareness in a Traditional City: Lessons from Osogbo, Nigeria

Ibereola Tolu Ibitoye*, Oluwole Philip Daramola, David Mobolaji

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

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*Corresponding author:
ibitoyeibereola@gmail.com

ABSTRACT

Human activities within the environment have led to an increase in the number of environmental health challenges recorded in recent times. Accordingly, this study examined a significant aspect of environmental crisis: residents' environmental health awareness. The study focused on the traditional city of Osogbo, Osun State, Nigeria. Data were obtained via questionnaire administered to 198 residents, who were systematically sampled from the three residential zones (65 from the core zone, 67 from the transition zone and 66 from the suburban zone) of the city. The data analyzed involved frequency distributions, Chi-Square and ANOVA.

According to the data obtained, majority of the respondents were young adults between ages 31 and 45 (52.5%). Also, 40.9% of the respondents were males, while majority were females (59.1%). Majority of the respondents earned between ₦70,000 and ₦149,999 (55.0%). It was found that level of awareness varied throughout Osogbo, with, most respondents being very aware of the listed environmental health measures based on the Relative Importance Index generated from the responses. Equally varying across the city was the level of effectiveness of environmental health measures that can engender positive environmental health responses, as only 6 out of the 13 existing measures were rated to be very effective by the respondents.

Thus, this study recommends that environmental health bodies utilize approaches that may be suitable for each residential zone. This approach will raise awareness about environmental health among residents and enhance their understanding of environmental health. Furthermore, individuals, community-based organizations and the government should work together to provide environmental health facilities, as this will elicit more positive responses from residents.

Keywords: Environmental health awareness, Traditional city, Environmental health response, Residents, Osogbo

1.0 Introduction

The state of the environment has a considerable influence on human health and should be prioritized, given that health is one of the most precious values in life (Bulan et al., 2023). A person's health cannot be separated from their environment, which is where they get food, clean water and fresh air, among others. A healthy environment enhances healthy living and prevents health risks (Perry, 2022; Jane et al., 2024). In many environments, however, people are exposed to various health including air pollution and contaminated water. Environmental health,

therefore, concerns how such negative exposures affect human health and determine ways to control or eliminate environmental hazards (Ratnapradipa et al., 2011). Environmental health can be defined as being free from illness or injury arising from exposure to environmental conditions that are potentially detrimental to human health (Dixon et al., 2009). Environmental health can also be referred to as the theory and practice of evaluating, amending, monitoring and averting environmental factors that could possibly affect the health of current and future generations.

Despite the efforts of environmental health to reduce negative environmental elements to which people are being exposed to, various health challenges remain evident owing mostly to ignorance, which has fuelled the lackadaisical attitude of people towards maintaining a healthy environment (Ratnapradipa et al., 2011; Daramola, 2015; Osungbohun, 2019). It is therefore necessary for residents to become aware of environmental health, as the extent of environmental health awareness will determine people's response to their environment. Indeed, environmental health awareness is knowledge about how human behaviour affects the environment and how humans can commit to engaging in activities that will protect the environment.

2.0 Literature Review

Diseases such as asthma, malaria and eye infection, as well as around one-third of all deaths in developing countries like Nigeria, actually result from avoidable environmental hazards such as contaminated water, poor hygiene, inadequate sanitation, poor water resource management, use of unsafe fuels, atmospheric pollution and poor infrastructure (Minh et al., 2006; Babayemi & Dauda, 2009). This concerning situation requires urgent attention (Adebamowo et al. 2006). Based on the forgoing it is important that residents acquire environmental health knowledge (Sousa et al., 2020), since residents' level of awareness of how the state of the environment affects their health will determine how they relate with it and to what extent they attempt to maintain the overall health of the environment (Lindsey, 2021; Lin, et al. 2025). It will equally enhance the provision and utilization of environmental health facilities and the overall effectiveness of environment health measures. Environmental health awareness cannot exist in isolation, as its success largely depends on the active involvement of people.

Osogbo, located in the Western Nigeria state of Osun is a traditional city with diverse environmental conditions, each of which is peculiar to a residential zone and has implications for human health (Olawuni, 2007; Daramola & Olowoporoku, 2017). The discrepancies between the population distribution and urban growth in the city are responsible for the various environmental health challenges evident in certain areas such as improper waste disposal, flooding, and environmental pollution, among others. This has led to outbreaks of diseases and deaths in some cases (Osungbohun, 2019). Therefore, it is expedient to assess what residents within the study area know about environmental health. It is equally important to examine their responses to the environment in relation to their level of awareness of environmental health. This study, therefore, assessed environmental health awareness in Osogbo, Nigeria.

3.0 Conceptual Framework

Living in a healthy environment is crucial to human well-being, which is the main concern of environmental health (Joshua et al. 2023). In achieving a healthy environment, it is important that people acquire the right environmental health knowledge, which is the bedrock of a positive response to or relation with the environment (Murphy, 2002). This is because the quality of environmental health information, that residents acquire, coupled with encouragement from appropriate quarters such as government, encourages public and personal habits that promote environmental health (Owoeye & Adedeji, 2003; Vicente & Reis, 2008).

Acquired environmental health knowledge will thrive better when people also understand the importance of environmental health facilities and services and how they can be accessed (World Health Statistics [WHS], 2021). Educating and sensitizing residents about environmental health measures is equally important in enhancing behavioural change in residents, if there is proper

monitoring from appropriate authorities. The mode of publicity and enforcement of existing environmental health measures determines the level of awareness and the way it influences the mindset of residents about environmental health. The effectiveness will be evident in the importance placed on utilizing environmental health facilities and services and their overall response to the environment (Olowoporoku, 2017; Baez et al., 2018; Abun & Racoma, 2019; Wula, 2019).

Socioeconomic characteristics of residents such as age, gender, level of education, income and marital status, among others, also play a part in residents' environmental health awareness (Owens et al., 2000; Ciobanu, & Bahna, 2015; Sousa et al., 2020). This is because the socioeconomic characteristics of residents determine the desire to acquire and the level of understanding of the acquired knowledge. It also determines the level of importance residents place on environmental health facilities, services and existing measures (Institute of Medicine, National Research Council [IMNRC], 2013; Liu et al., 2015). A schematic presentation of the conceptual framework is shown in Figure 1.

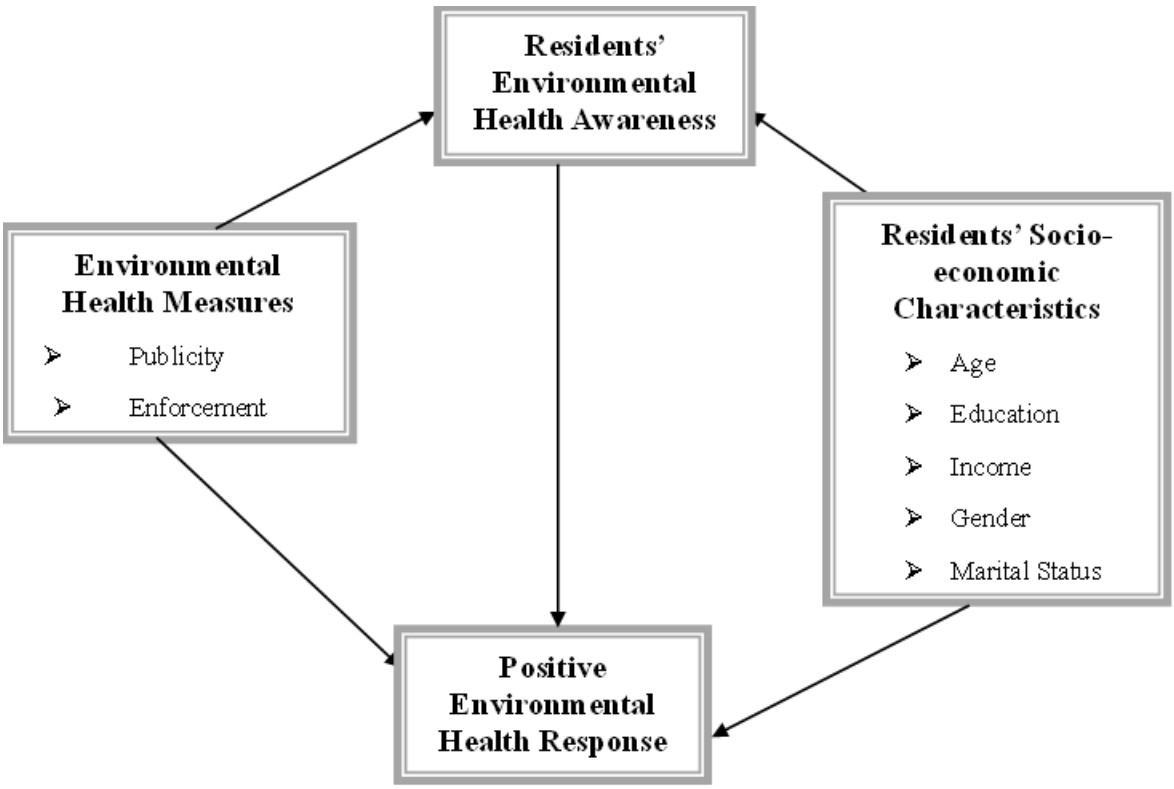


Figure 1: Conceptual Framework of Environmental Health Awareness

4.0 Methodology

Osogbo, the study area, is the capital of Osun State, which was created out of the old Oyo state in 1991. Located in south-west Nigeria. Osogbo sits between latitude $7^0$46' and $7^0$76' North of the equator and between longitude $4^0$34' and $4^0$56' East of the Greenwich Meridian. Osogbo is made up of both Osogbo Local Government Area and Olorunda Local Government Area with their headquarters in Oke Baale and Igbona, respectively. Osogbo shares boundaries with Iragbiji, Ikirun, Ede and Ilesha and is easily accessible from any part of the state because of its central position. It is situated on an undulating land covering an area of about 140 square kilometers and an altitude of 366 meters above sea level. According to National Population Commission (1991), Osogbo had a population of 187,704 people. However, the projected population of the capital city for 2018 was 355, 436, that of 2023 was 395,215 people and, that of

2025 was 422, 138. These projections are based on the Nigerian population growth rate for each year.

Multistage sampling technique was adopted in the study, with the city, stratified into three residential zones comprised by the core, transition and suburban zones across its two Local Government Areas, as is typical of traditional cities. The next stage was the identification of political wards. According to the Independent National Electoral Commission (2024) there are twenty-three (23) electoral wards across both local government areas, with 15 in Osogbo Local Government Area and 8 in Olorunda Local Government Area.

Table 1: Distribution of Political Wards across the Residential Zones in Osogbo

Residential Zone	**Local Government Areas**			
	Osogbo		**Olorunda**	
	Names of political wards	**Names of selected political wards**	**Names of political wards**	**Names of selected political wards**
Core	Otun Jagun A Alagbaa Aare-Ago, Jagun B	Alagbaa	Owode 1, Atelewo, Owoope, Akogun	Atelewo
Intermediate	Ataoja A, B, C, D and E, Eketa, Otun Balogun, Ekerin, Otun Jagun B	Ekerin	Owode II, Balogun	Balogun
Suburban	Baba kekere, Jagun A	Baba kekere	Ago wande , Ayetoro	Ayetoro
Total Number of Wards	**15**	**3**	**8**	**3**

As a result of the similarity of the residential zones, for the questionnaire administration, one ward was chosen randomly from each of the zones in the respective LGAs making up Osogbo Town (Table 1). Using this method, respondents from six out of the wards present in the study area were sampled. According to information from Google Earth and the researchers' reconnaissance survey, there were 4,138 residential buildings in the selected political wards in Osogbo. For questionnaire administration, a systematic random sampling technique was used in selecting the sampled residents. In this case, the first building was randomly selected. For the subsequent units of investigation, every 20th building, representing 5% of all residential buildings in the selected wards was selected (Table 2).

Table 2: Number of Selected Buildings across the Residential Zones

Residential Area		**Olorunda**	**Osogbo**	**Total**
Core	No. of Buildings	725	658	1383
	Sample size (5%)	36	33	69
Intermediate	No. of Buildings	735	653	1388
	Sample size (5%)	37	33	70
Suburban	No. of Buildings	640	727	1367
	Sample size (5%)	32	36	68
Total	Total number of Buildings	2100	2038	4138
	Sample size (5%)	105	102	207

Thus, residents from 207 residential buildings were sampled across the selected wards in the study area. The target persons for questionnaire administration included any available adult member of the household from the sampled buildings. The 207 copies of the questionnaire were administered as stated above, with only 198 of them recovered and analysed. This comprised 65 from the core, 67 from the intermediate and 66 from the suburban residential zones, respectively. Items captured in the questionnaire included the profile of the respondents and residents' environmental health awareness. The Relative Importance Index (RII) for the awareness of environmental health practice was calculated using the formula SWV/ (A*N):-

where; SWV is the Sum of Weighted Value (the weighted value is the weight attached to each variable based on the responses.

For this study, 5 = Very Aware, 4 = Aware, 3 = Moderately, Aware, 2 = Slightly Aware, 1 = Unaware).

A is the highest weight which is 5 for this study
N is the total number of respondents.

The RII value ranges from 0 to 1, with the distance of the value to 1 determining its importance. High importance ranges from 0.8 to 1, medium importance ranges from 0.4 to 0.7 and low importance ranges from 0 to 0.3.

The effectiveness of each environmental health measure was rated on a five-point Likert scale (5 = very effective, 4 = effective, 3 = moderately effective, 2 = slightly effective and 1 = not effective). These values were used to develop an index on the effectiveness of measures. This is presented in Table 3.

Table 3: Effectiveness Index

	Index Developed for Analysis	**Mathematical Expression**
Effectiveness of environmental health measures	Environmental Health Effectiveness Measures Index (EHMEI)	$\frac{\text{SWV}}{\sum_{i=1}^{5} X_i}$

For effectiveness of environmental health measures, SWV was the total weight value, X_i was the number of respondents rating for variable *i* and Y_i was the weight attached to variable *i*, (i = 1, 2, 3, 4, 5). The closer the value of index is to 5, the stronger it rating and the more effective it ranked among other measures.

5.0 Results and Discussion

5.1 Socioeconomic Characteristics of the Respondents

The socioeconomic characteristics of the respondents were presented in Table 4, showing gender, religion, marital status, occupation, highest educational attainment, age, average monthly income and household size.

Gender plays an important role in the perception of residents on environmental health issues (Ekong, 2015). Findings revealed that both male and female genders were ably represented in the study: 40.9% males and 59.1% females (Table 4). This indicates that the female respondents were more available, thus corroborating the conclusion by Wenz (2001) and Aditya (2006) that women are more environmentally concerned and that they relate more with the environment than men. The Chi-square value ($\chi^2 = 6.545$, $p = 0.011$) revealed that no significant difference was found in the gender of the respondents throughout the three residential zones.

Religion is a particular system of faith and worship (Routhe, 2013). Data obtained from the study revealed that the predominant religious inclination of most respondents (58.6%) was Christianity, while the rest of the respondents (41.4%) practised Islam (Table 4). Further findings ($\chi^2 = 154.455$, $P = 0.000$) established that the religion of respondents varies across the three residential densities. The results on the marital status of respondents, as presented in Table 4, revealed that across the three residential zones, 26.8% were single, majority (72.2%) were married and, 1% were widowed. This implied that married people were more environmentally concerned and engaged in environmentally friendly activities, as earlier found by Melgar et al. (2013). Further findings of $\chi^2 = 154.455$ and $P = 0.000$, revealed that no significant difference was found in the marital status of respondents across the residential zones.

The occupation of respondents is important in environmental health awareness and response as affirmed by Abalo et al. (2017). In this study, respondents' occupations were categorized as students, civil servants, artisans, traders, business-owners, and those working with private establishments. Majority of the respondents were

civil servants (68.2%), followed by private workers (10.1%), artisans (8.6%), traders or business owners (7.1%) and students (5.6%) (Table 4). A χ^2 = 288.667 and P = 0.000, established that there was variation in the occupation of respondents across the three residential zones.

In this study, respondents' highest educational attainment was classified into three different categories. The first was the junior secondary level, the second was the senior secondary level and the third was tertiary education. The tertiary education level comprised those with National Diploma (ND), National Certificate of Education (NCE), Higher National Diploma (HND), university degrees and postgraduate degrees. In the study area, 0.5% of the respondents had junior secondary education, 2.0% of the respondents had senior secondary school education and, 97.5% had tertiary education as their highest level of education (Table 4). Since majority of the respondents were educated, it is believed they would have been exposed to environmental education and would be environmentally conscious, as suggested by Meyer (2015). The result of the Chi-square (χ^2 366.636 and P = 0.000) showed that a significant difference was found in the highest educational attainment of the respondents throughout the three residential zones.

Ages of the respondents were classified into three: youth (21-30 years), young adult (31-45 years) and adult (46-60 years). The results across the residential zones showed that majority of the respondents (52.5%) were young adults, followed by youths (30.8%), while the lowest proportion of respondents (16.7%) were adults (Table 4). Further findings revealed that the average age for the core, transition and suburban zones were 31, 35 and 40 years respectively, while the overall mean age was 37 years. This implied that the respondents were predominantly young adults who would be environmentally concerned, a finding supported by Daramola et al. (2023). The F^2 = 18.046, P = 0.000 revealed that a significant difference was found in the ages of respondents all through the three residential zones.

Respondents' average monthly income was categorized into four: those earning less than ₦70,000, those earning between ₦70,000 and ₦149,999, those earning between ₦150,000 and ₦250,000 and those earning above ₦250,000. In the study area, majority of the respondents earned between ₦70,000 and ₦149,999 (55.0%), while those who earned less than ₦ 70,000, between ₦150,000 and ₦250,000 and above ₦250,000 were 19.7%, 15.7% and 9.6%, respectively (Table 4). The results further showed that the income increased from the core to the suburban residential zone, which is similar to the findings of Afon (2005), Afon and Faniran (2013), Daramola and Olowoporoku (2016). Also, respondents in the core zone had the highest number who earned less than ₦70,000, while only the suburban zone had respondents who earned above ₦250,000, a finding which affirmed the difference in class of people residing in the different residential zones. In addition, the F^2 = 186.237 and P = 0.000 further established the significant variation in the average monthly income of respondents in the residential zones.

A household can be defined as persons or a group of people with shared cooking, living arrangements and other resources (Willekens, 2010). Based on this, the household sizes of respondents were grouped into three, viz: small (less than 4 members), medium (4-6 members) and large (more than 6 members). Results showed that majority (67.2%) of the respondents across the three residential zones had households falling into the medium category, followed by households in the small category (24.2%), while 8.6% which is the least category were those households that fell in the large category (Table 4). A F^2 = 7.493 and P = 0.001, α = 0.05 established that a significant difference was found in the household size of the respondents all through the three residential zones.

5.2 Awareness of Environmental Health Practices

Results for residents' level of awareness of different environmental health practices in the study area were presented in Table 5. Based on the Relative Importance Index of the awareness of environmental health practices presented in Table 5, majority of the responses had high importance across the various residential zones. This indicated a high level of awareness of the listed environmental health practices. Only 'people affected with communicable diseases in the community should be

isolated' had a medium rating in the core (0.77) and transition zones (0.74). Generally, there was a high level of awareness of the listed environmental health practices across the three residential zones. This could be because most of the respondents were young adults, married, females and educated. Studies have established that there is a connection between youthfulness, level of education, gender, religion and environmental health awareness and practice as a whole (Daramola, 2012; Daramola, 2015; Asekun-Olarinmoye et al., 2014; Olowoporoku, 2016; Sidney-Nnebue et al., 2020; Ibitoye et al., 2025).

5.3 Effectiveness of the Existing Environmental Health Measures

This subsection examines, the level of effectiveness of the listed environmental health measures. A measure can be tagged effective, if it is properly communicated to the respondents to ensure awareness, if there is proper enforcement and if there are feedbacks from the people for whom the measure was made (Osungbohun, 2019). Respondents in the study area attributed the highest level of effectiveness to the measure stating that a person or company intending to engage in commercial collection of waste shall apply for a license (3.94) (Table 6). Some other measures rated to be very effective by the respondents, because their EHMEI values were higher than the general mean value were those stating that all premises shall be kept clean at all times (3.81), and that there shall be payment of prescribed fees by every occupant (3.75). Also rated as effective were, 'all wastes be conveyed only in approved vehicles or vessels' (3.74), 'provision of approved sanitary dustbin within every premise' (3.73) and 'disposal of waste in approved places' (3.69) (Table 6). Rated as least effective of all the measures in the study area, with an EHMEI value of 3.00 (Table 6), was 'owner or occupant of a premise or industry should report any accidental discharge within 24 hours'. This showed that only six (6) out of the thirteen existing measures had an EHMEI above the mean value as rated by the respondents, and this was consistent across the residential zones. The rating by the respondents revealed that the level of effectiveness across the study area was fair.

6.0 Conclusion

This study presented the environmental health awareness and response in the three residential zones of Osogbo, Nigeria. It was found that the socioeconomic characteristics of respondents can explain variations in environmental health awareness in the study area. Also, majority of the respondents had a high level of awareness of the listed environmental health practices. However, measures put in place to enhance these practices were fairly effective as rated by the respondents. This may affect the translation of the acquired knowledge into desired positive environmental health responses.

7.0 Recommendations

Based on the findings, this study recommends the design of improved methods of creating awareness about environmental health to ensure better understanding, which will translate into more positive responses. In addition, individuals should be encouraged to provide environmental health facilities at the household level. Efforts should also, be intensified by government and other bodies alike such as Community Based Organizations (CBOs) and Non-Governmental Organizations in the provision of public environmental health facilities while ensuring equal distribution across the residential densities. Moreover, it is important to ensure that these facilities are properly maintained and the usage of these facilities should be monitored by the appropriate bodies. There should also be, proper mechanisms by appropriate bodies to ensure effectiveness of existing environmental health measures in the study area. This will aid the spread of environmental health awareness and lead to more positive responses to the environment.

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