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Urban Settlement and Behavioural Exchange towards Environmental Policy among Urban Settlers in Southeast Nigeria: Implications for Environmental Policy Administration and Sustainability

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Abstract. *Environmental pollution as well as the sustainability of the natural environment is the product of behavioural exchange obtainable in a particular geographical setting and space of time but reconciled by policy and administration approaches obtainable from public institutions. As a mark of policy design obtainable in each behavioural setting, each environmental setting has its own expected behavioural disposition towards its design, more or less the symbolic identity of the people living in the setting. However, libertarian paternalism as a policy design approach as well as a policy option creates an outlook of observation of human rights as well as system-induced behavioural modifications for maximum cooperation and policy sustainability. In southeast Nigeria among the six geopolitical zones of the country, environmental pollution has appeared as an identity for many cities over the years. While some scholars have looked into the matter from other dimensions, a research design targeting the essence of symbolic behavioural exchange in the understanding of the issue of urbanites and environmental policy administration and affecting natural environmental management and urbanites still needs to be created. Applying the theoretical framework of libertarian paternalism and a survey research design, this study adopted a coherent analysis to capture the behavioural exchanges towards the natural environment between urbanites and government institutions implementing environmental management policies. This was substantiated through primary data obtained via a quantitative data collection instrument, involving 640 respondents (aged 18+) from southeast Nigerian urban communities. The study adopted descriptive statistics as well as a linear model to analyse the data obtained. According to the findings of the study, there is evidence of wide environmental pollution behaviour among urbanites, a weak policy framework, and implementation elicited covert anti-environmental protection behaviour (R= 0.481, F= 38.097& P= .000). Commitment to environmental protection depended on the policy awareness and the public trust of the government institutions managing the environment; awareness of environmental issues, etc. (R= 0.906, F= 238.090 & P= .000). Government policies and the functionality of the government institutions managing environmental issues affected the public*

knowledge of the natural environment and support to the public policy on the management of the natural environment among urban settlers in southeast Nigeria (R= 0.818, F= 256.838& P= .000).

Keywords: *Nigeria, cities, environmental pollution and protection; environmental sustainability; policy sustainability; public administration*

Raktažodžiai: *Nigerija, miestai, gamtos užterštumas ir apsauga; gamtos tvarumas; politikos tvarumas; viešasis arministravimas*

Introduction

Human behavioural exchange in society is between the leaders and the lead on the one hand and among the leaders on the other hand. It is a subject of a policy framework obtainable among a given population. While the behavioural exchange followed the trajectory of micro, mezzo and macro levels of interactions in terms of stages of administration and power exchange, the policy framework guiding these relationships and behavioural exchanges follow divided interests among the members of the society. Among other things, the natural environment is a salient aspect of human existence and appears as part of the interests requiring policy and administrative attention for development and sustainability.

Going back to the ecological footprints as much as has been documented, man has always lived and survived in the environment (biosphere), courtesy of the healthiness of the environment itself (Weeks, 1999 as cited in Okafor, 2017). As Redman (1999 cited in Eidinow, 2016) observed, the symbiotic relationship between man and nature has existed for millions of years, sustaining man on this planet. However, the advent of industrialization and perhaps population explosion (Simmel, 1969; Lee, 1976) appeared to have altered this relationship leaving the natural environment to the mercy of humankind, as well as people at the mercy of the by-product of environmental pollution. As early as the 19th and 20th centuries, Simmel (1969), Max Weba (1965) and Lee (1979) have observed the implication of the expansion of the human population on the environment with its major concern on the administration of the population via policy design and capturing of human behavioural disposition towards surrounding phenomena. This, they believed, was possible through the administrative units and power structures obtainable in the settlement patterns among each given population.

Recently, environmental pollution in connection with rural urban migration has become one of the challenges facing sub-Saharan Africa and other developing economies across the globe. The wave of internal (rural-urban) migration in Nigeria, which has taken another dimension from 1990 in the postcolonial Nigerian economy, has invariably affected life in urban centres significantly. According to the 2006 Population and Housing Census, more than 10% of Nigerians are lifetime migrants or live in states other than their states of birth. Meanwhile, Internal Migration Survey conducted by the National Population Commission in 2010 revealed that 23% of the sampled population of Nigerians are migrants, having changed residence within 10 years. Further analysis of the survey showed that about 60% of internal migrants reside in urban areas, with obvious consequences on socioeconomic infrastructures in urban areas. The distribution of household population by migration status reveals that migrants constitute at least two-fifths of the total population in seven out of the 36 states of the country, while the majority (42.9%) of the states with a high population of migrants are located in southeast Nigeria. The states with a relatively high proportion of migrants across the six geopolitical zones in Nigeria are Abia (48.7%), Ekiti (48.1%), Delta (45.3%), Imo (45.1%), Anambra (44.4%), Bayelsa (43.2%) and Lagos (40.1%) (Abanihe & International Organisation for Migration, 2014).

Rural-urban migration has its own environmental implications, which in sum, reflect on the environmental outlook of the nation via the environmental performance index. „*According to the annual report of the Yale Centre for Environmental Law and Policy (2020), Nigeria was one of the nations with a poor environmental performance at the bottom of the list (151), with a score 31.0. According to the study, the policy objectives of the study focused on environmental health and*

ecosystem vitality, while the issue categories included in the study were air quality, sanitation, drinking water, heavy metals, waste management, biodiversity/habitat, ecosystem services, fisheries, climate change, pollution emissions, agriculture and water resources" (Okafor et al., 2022). Furthermore, operational indicators measured in the study included unsafe drinking water, unsafe sanitation, solid waste, among others (Papadimitriou, Neves, Saisana & Joint Research Centre, 2020). In general, „*high scorers in the environmental performance index (EPI) exhibit long-standing policies and programs to protect public health, preserve natural resources and decrease greenhouse gas emissions. The low EPI score of Nigeria indicates the need for greater attention to the spectrum of sustainability requirements, with a high-priority focus on critical issues such as air and water quality, biodiversity, and climate change*" (Okafos et al., 2022). „*Notably, the 2020 rankings include, for the first time, a waste management metric and a pilot indicator on CO2 emissions from land cover change. Other new indicators deepen the analysis of air quality, biodiversity & habitat, fisheries, ecosystem services and climate change*" (Wendling et al., 2020).

Urban environment pollution, which manifests mainly in waste, air pollution, poor sanitation, pollution of water resources through sewages, heavy metals, pollution emissions, etc., has been a cankerworm eating deep into the health, wealth and development of the people in Nigerian urban communities. Waste is a major urban challenge in Nigerian cities as a result of its ubiquity (Mba & Nzeadibe, 2017). Owing to rapid industrialization and an increase in population and urbanization, the generation, disposal or management of waste have proved to be a significant environmental and development issue in Nigeria. Urban waste management has emerged as a major problem for modern societies in recent years. „*An optimal waste management system is essential to prevent the pollution burden and associated health-related issues*" (Tanzila & Faisal, 2021).

In recognition of the enormity of the problems posed by urban waste, the Nigerian government established the Federal Environmental Protection Agency (FEPA) through the promulgation of decree 58 of 1988. The constitution of the Federal Republic of Nigeria 1999, section 20 provides that the state is empowered to protect and improve the environment and safeguard the water, air, land and forests. The policy goals of Nigeria's National Policy on the Environment are to achieve sustainable development (FEPA 1999). The policy reiterates that Nigeria is committed to a national policy that ensures sustainable development based on proper management of the environment in order to meet the needs of the present and the future (Mbah & Nzeadibe, 2017; Okolie et al., 2020).

There are numerous laws and agencies regulating waste management in Nigeria. These comprise The National Environmental Standards Regulatory and Enforcement Agency (NESREA); Federal Ministry of Environment; States' Ministries of Environment; Ministry of Water Resources; and different states waste management experts; States' Environmental Protection Agencies (Maikai et al., 2020); for example Enugu State Waste Management Authority (ESWAMA), Abia State Environmental Protection Agency (ASEPA), etc., all the states in southeast Nigeria have state environmental laws. However, over the years, these institutions/agencies seem to have failed in the objectives designed for them to achieve as virtually all Nigerian cities, especially in southeast Nigeria, are battling with heavy waste scattered all over the cities. As the present study aimed to understand and unveil, the operations of these institutions/agencies appeared to be alien to the urbanites and, by implication, affected the possibility of cooperation of the urbanites with the public institutions responsible for environmental management and protection. Over the years, studies in southeast Nigeria have consistently shown the inability of the government institutions to keep the goals of the environmental laws and policies designed to manage the natural environment. This is manifested in the problem of indiscriminate waste disposal and disregard for the public locations and rules for the disposing of waste in the region (Okwesili & Ndukwe, 2016; Nwagbara et al., 2012; Nnaemeka-Okeke, 2014; Chukwuemeka, Igwegbe & Ugwu, 2012)

The relationship between the urbanites and the natural environment in any case can be understood via the approach to environmental policy and administration as it is obtainable in different city contexts, at least across Nigeria as a nation (Okwesili & Ndukwe, 2016; Daramola & Ibem, 2010). This is due to several reasons. First, each city exists under a state government, which in itself

is an administrative unit under what we have as the federal government of Nigeria while, the state government operates a somewhat domestic environmental policy, which can be observable in the ways different states manage their environmental issues administratively (Okwesili & Ndukwe, 2016; Okafor, 2017). Secondly, the protection of the environment from all types of pollution cannot be done on moral grounds, but on legal and administrative grounds at least, in the current African historical epoch, as most of the citizens still lack the appropriate knowledge of the basic symbiotic relationship between man and natural environment (Okafor, 2017).

Following the irregular patterns of city formation in Nigeria and its attending challenge of behavioural antagonism towards (1) policy and administrative design for the management of human behaviour and activities and (2) environmental sustenance among the urbanites, the urban settlements in Nigeria have been made vulnerable to environmental pollution of all kinds (Nnaemeka-Okeke, 2016; Kjellstrom & Mercado, 2008). More so, government environmental policies in Nigeria since 1990, which were designed to mitigate the problem of environmental pollution among the urbanites, has appeared to be mere paperwork that has no impact on the everyday life of the citizens, especially in the face of behavioural exchange between the government authorities and the citizens beclouded by mistrust, corruption and insincerity (Ministry of Environment, 2016; Kankara, 2013; Wonah, 2017, Akamabe & Kpae, 2017). While some scholars have seen the problem from the angle of government insincerity and inconsistency towards the policy and administrative frameworks overtly obtainable among the population (Kankara, 2013; Wonah, 2017, Akamabe & Kpae, 2017), other scholars have seen the problem from the angle of the process of the emergence of the cities in Nigeria, which in most cases lacked any definite pattern (Lamond, Awuah, Lewis, Bloch & Falade, 2015; Wekesa & Otieno, 2013; Sawyer, 2014). Similarly, other scholars have seen the problem of urban environmental pollution among the urbanites who defy the policy and regulatory frameworks put in place, from the angle of disintegrated ethnic and tribal groups who found their ways into the city with different behavioural profiles towards the natural environment and the constituted authorities (Okwesili & Ndukwe, 2016; Eko, Ayama, Eni, Eja & Esien, 2012; Block, 2014).

By 2060, Nigeria is expected to experience unprecedented urbanization, with more than 50% of its citizens living in urban areas, which will translate into huge policy and administrative issues in managing the population, especially against environmental pollution (Okwesili & Ndukwe, 2016; Ministry of Environment, 2016). Also, Nigerian cities, especially in southeast Nigeria, are characterized by a poor response to public policy and adherence to social order and a high degree of environmental degradations affecting the lithosphere, hydrosphere and the atmosphere (Okafor, 2017; Okwesili & Ndukwe, 2016; Ministry of Environment, 2016). Among the cities in southeast Nigeria found in the five states of the region, such as Abia, Anambra, Ebonyi, Enugu and Imo states, the dumping of refuse, blockage of the drainage system, indiscriminate discharge of sewage as well as an uncontrollable spread of waste plastics materials are common among the population in the urban settlements (Nwagbara et al., 2012; Nnaemeka-Okeke, 2014; Chukwuemeka, Igwegbe & Ugwu, 2012; Ndinwa, Akpafun, Chukwuma & Nwakaego, 2012). Irrespective of the national and state policies and administrative measures on environmental management applicable to these cities, environmental pollution has become a normal thing among the inhabitants and most inhabitants of these cities cannot differentiate between the designated public waste bin and the sacred places in terms of environmental hygiene.

In places such as Aba, Umuahia, Onitsha, Nnewi, Awka, Enugu, Nsukka, Abakiliki, Owerri, public waste management agencies are overwhelmed with indiscriminate dumping of refuse (Onwughara, Nnorom & Kanno, 2010; Ugwueleka, 2009; Nwokocha, 2012). „*Typical solid waste disposal practice in Nigeria is an open dump. While some use streams as routes to transport their solid waste out of their sight, some specifically dump their solid waste by the street sides. In some segments of Nigeria, a dump is usually covered; some imprudently blaze it (Igoni, 2007). According to Babayemi and Dauda (2009) and Nkwachukwu et al. (2010), in Nigeria, waste is often dumped by roadsides in accessible open pits, rivers, and gutters*“ (Maiyaki et al., 2019). For example, in Abakaliki, every street was full of heaps of refuse, while Iyiokwu and Iyiudele rivers were converted

into a dumping arena for domestic waste and human excreta. The World Youths Soccer Championship slated for Nigeria in 1995 was cancelled because of the outbreak of cholera (i.e., a product of filthy environment) in Abakaliki (Uka, 2013). There is a persistent increase in the number of indiscriminate solid waste disposal dumps despite the provision of the customized States' Environmental Protection Agencies waste bins/stationary trucks.

The level of public compliance with States' directives on taking waste to designated neighbourhood dustbins, waste bagging, cleaning the neighbourhood on environmental sanitation days (usually one Saturday in a month) and payment of sanitation rates has always been lown in southeastern Nigeria (Eneh and Anamalu,2012)

Although many researchers have approached the issues of environmental pollution among the urbanites in Nigeria in general as well as in some of the aforementioned cities/urban settlements, there are still some empirical questions yet to be answered. For instance, while most of these researchers have approached the matter from the dimensions of the government policy approach, socio-ethnic and cultural differentiation among the inhabitants, socio-historical antecedents, etc. constitute a distinct approach to the matter via the interaction between the urbanites, public environmental policy and the natural environment. In essence, the policy and administrative measures by the government and how urbanites view and follow these measures in view of their everyday interaction with the natural environment are yet to be ascertained in an empirical way. The fact that Nigeria is still battling with the issue of public trust as well as the clear cut edge of legality and morality points to this necessity. The crises of legality and morality in approaching public policies still create a serious loophole in the public policy process and implementation in different areas of public administration. Similarly, the behavioural disposition towards the natural environment and the public institutions on the environment represented by the extant laws/policies on the environment have not been subjected to advance empirical modelling to extrapolate the indices of pro and anti-environmental behaviours among the urbanites in this region. As one of the tasks of behavioural and management sciences, human behaviour towards natural and other surrounding phenomena is subject to the fluid networks of actions and activities, which the individuals perceive and involve in them. For clarification and policy design and implementation purposes, these dots of activities and actions as indices are evaluated for the most enduring indices to understand the human behaviour towards a particular phenomenon as the present study succeeded in bringing to the fore with regard to the natural environment, public policy and the urbanites' behaviour in southeast Nigeria. As one of the gaps in the literature, the perception of the policy and policy implementation agencies in terms of their compelling strength and the corresponding behavioural disposition by the urbanites have not been tested in the southeast region of Nigeria. In essence, the way public policy is designed and implemented has its implications on the general public. For example, perceived weak policies and policy implementations affected the response from the general public. The perceived weaknesses in the policy design and implementation processes affected the achievement of the goals of environmental policies in this region, as the model applied in testing commitment to environmental policies revealed. Knowledge of the natural environment has been proven to boost pro-environmental behaviour, at least in other parts of the world. In the present study, knowledge of the natural environment among the urbanites in southeast Nigeria became pertinent in view of the fact that the available studies on the environment and behaviour in the region have skewed the knowledge aspect of the problem. The study tested the knowledge of the natural environment among the urbanites and its implications to the overall commitment to public environmental policies as well as pro-environmental behaviour. As a premise to include environmental knowledge as a variable in the study, environmental knowledge among the southeast Nigerian urbanites has been reported by a number of researchers in various dimensions, showing a scanty but inconsistent direction with regard to environmental pro behaviour (Ikoro & Ezeanyim, 2016; Ezezika & Adetona, 2011; Odey, Abo, Li, Zhou & Giwa, 2018). However, as part of the research interest in this study, this was investigated to create a background for environmental knowledge as a variable in the study.

In view of the aforementioned environmental and behavioural management issues bordering on libertarian paternalism among the public policy administrators and the urban populace, the study carried out a scholarly evaluation of the environmental pollution challenges in southeast Nigeria and applied the framework of Thaler and Sunstein with the support of survey data from the urban settlers in southeast Nigeria n order to understand its policy and administrative implications to the region and further the knowledge of environmental policy for pedagogical purposes and policy significance. Specifically, the paper is interested in answering the following research questions:

1. What is the behavioural exchange of environmental management and sustainability among the urbanites and the public policy administrators in southeast Nigerian cities?
2. What are the public perceptions towards the government institutions managing the natural environment among the urbanites and the corresponding behaviour in the southeast Nigerian cities?
3. What are the factors affecting commitment to the protection of the natural environment among the urbanites in southeast Nigerian cities?
4. What is the relationship between the perceived policy strength and behavioural disposition towards environmental pollution among the urbanites in southeast Nigerian cities?
5. What is the relationship between the knowledge of the natural environment and behavioural disposition towards environmental pollution among the urbanites in southeast Nigerian cities?

Theoretical Framework

Behavioural exchange is heavily dependent on the nature of policy and the input made in the policy process from formulation to implementation. Behavioural theorists believe that a rational approach to policy formulation and implementation is an ungrounded assumption since human beings face limitations in their mental resources. This study adopted libertarian paternalism as the framework of analysis.

Libertarian paternalism propounded by Thaler and Sunstein (2003) „*is the idea that it is both possible and legitimate for public institutions to affect behaviour while also respecting freedom of choice as well as the implementation of that idea*". The authors further elaborated upon their ideas and propose that libertarian paternalism is paternalism in the sense that it tries to influence choices in a way that will make the third parties better off, as judged by themselves. It is libertarian in the sense that it aims at ensuring that people should be free to opt-out of specified arrangements if they choose to do so. The possibility to opt-out is said to preserve the freedom of choice. According to Thaler and Sunstein (2003), „*a policy counts as "paternalistic" if it is selected with the goal of influencing the choices of affected parties in a way that will make those parties better off*". They emphasized the possibility that in some cases, individuals make inferior choices, choices that they would change if they had complete information, unlimited cognitive abilities and no lack of willpower.

Although human behavioural challenges in some contexts appear to be anti paternalistic, the inevitability of public affairs management procedure contrary to some individuals' choices always makes room for paternalism. According to Thaler and Sunstein (2003), „*once it is understood that some organizational decisions are inevitable, that a form of paternalism cannot be avoided and that the alternatives to paternalism are unattractive, we can abandon the less interesting question of whether to be paternalistic or not and turn to the more constructive question of how to choose among paternalistic options*".

Contrary to anti-paternalistic arguments, the presumption that individual choices should be free from interference is usually based on the assumption that people make adequate choices or at least that they do more than the public institution and the likes could do for the general public. However, there is little empirical support for this claim (Thaler & Sunstein, 2003). „*People do not exhibit rational expectations, fail to make forecasts that are consistent with Bayes' rule, use heuristics that lead them to make systematic blunders, exhibit preference reversals and make different choices depending on the wording of the problem*" (Kahneman & Tversky, 2000; Thomas Gilovich, Griffin & Kahneman, 2002). Similarly, faced with an intertemporal choice, people exhibit dynamic

inconsistency, giving preference to the present realities compared to the future expectations. In other words, people have self-control problems (Choi, Laibson, Madrian, & Metrick, 2003; O'Donoghue & Rabin, 2003). According to Thaler and Sustein (2003), „*in many domains, people lack clear, stable or well-ordered preferences; what they choose is a product of framing effects, starting points and default rules, leaving the very meaning of the term "preferences" unclear*". According to paternalistic principles, it is legitimate for private and public institutions to attempt to influence people's behaviour even when third party effects are absent. In other words, Thaler and Sustein (2003) „*argue for self-conscious efforts by private and public institutions to steer people's choices in directions that will improve their own welfare*".

Environmental management in Nigeria and southeast Nigeria specifically is anchored on the policy design bearing the hallmark of paternalism in Thaler and Sunstein's (2003) theoretical framing. While the citizens lack the foresight to make appropriate decisions to protect the natural environment due to poor environmental awareness, knowledge of the symbiotic relationship between man and the natural environment, and the lack of appreciation of esthetic values in the public environmental setting, the government via expert recommendations possess the capacity and the foresight to make rules and regulations in the management of the natural environment since the citizens will still expect the government to maintain a healthy environment as a mark of good administration of the state. The extant rules in the management of the natural environment are diversified; one of the dimensions of management include waste management and disposal. Waste management and the overall public orderliness on the management of the natural environment have been a major issue over the years in southeast Nigeria.

We anchored the theoretical framework on libertarian paternalism. Its proponents claim to provide a new instrument to facilitate the formulation of the effective and evidence-based policy, taking people's actual behaviour into account from the outset. This can be seen as behavioural insights. Behavioural insights offer a powerful tool to reshape and design new evidence-based policies (Kuehnhanss, 2018). As observed in the area of environmental policy, government policies are designed on the assumption of rationality concerning the behaviour of citizens. They believe that human beings would behave rationally in reaction to policy interventions. This assumption has been challenged on the basis that people tend not to act like Homies Oeconomici but face limitations in their mental resources (such as willpower, computational capacity and memory), leading to predictable biases (Kuehnhanss, 2018, DellaVigna, 2009; Kahneman & Tversky, 2000). In policy design, to achieve the policy goals paternalistic interventions, nudging is necessary.

The plausibility of libertarian paternalism has been tested in a number of studies elsewhere on public and private institutional policies with promising results (Schmidt, 2017; Wilkinson, 2013; Kniess, 2021; Willis, 2013). However, a number of scholars have questioned the justification of libertarian paternalism on the grounds that it may not be suitable for all contexts. As Kniess (2021) maintained, preference architecture constitutes a fundamental challenge to the justificatory basis of Libertarian Paternalism. Libertarian paternalism has many critics, which can be grouped in terms of normality, rationality, human development, choice, individualism and private interests (Berg & Gigerenzer, 2010; John et al., 2009; Klick & Mitchell 2006; VanDevender, 2008; Le Grand, 2008; Butland et al., 2007; Lake & Townshend, 2006; Strauss, 2009; The Economist, 2010). Meanwhile, Gill and Gill (2013), in their critiques, „*highlighted the difficulties of justifying libertarian paternalist techniques being applied to socially rather than individually defined ends and the harm those techniques can do to those who are not their intended targets. However, they set out seven imperatives for those who evaluate potential libertarian paternalist policies. The seven imperatives are: clarify and justify the ends pursued; explore how citizens might be right; question notions of what is good; respect those not targeted; treat rationality only as a means; avoid deception; and maintain individuals' self-reliance*" (Gill & Gill, 2013).

The behavioural exchange between the government and the citizens is the policy design and administrative order from the governing authority and the response towards these policies and administrative orders by the common citizens. In the ongoing interactions between the government

and urbanites, trust and expected responsibilities tend to control the behavioural disposition towards the natural environment. The public perception of the government policy approach to the management of the natural environment matters to the success of the policy itself and the overall scholarly interest in the whole gamut of environmental studies in southeast Nigeria. Following the libertarian and paternalism model, the public perception of the environmental policy either reinforces the success of the policy itself or hinders the policy itself as libertarian paternalism hinges on the instruction for behaviour as well as the observation of the extant rights of the citizens. This equally goes for the public perception of the policy strength itself. How forceful or polite public environmental policy appeared affects the success of the policy itself in actualising the set goals. As part of the research questions and interest of the present study, understanding the public perception of the strength of the public environmental policy and its implication to the commitment to environmental protection and management is crucial in the ongoing global documentation on environmental sustainability on micro and macro scales. As the libertarian paternalism principle posed to proof, there is a gap between the knowledge of the natural environment and the willingness to commit oneself to the protection and sustaining of the natural environment. This gap is filled by the policy option in the paternalist principle. As a matter of our research interest, this was evaluated in the current study to build on the existing literature on environmental knowledge and public environmental policy.

Methodology

Southeast Nigeria as a geopolitical zone out of six geopolitical zones of the federal republic of Nigeria is made up of five administrative states, which are in turn made up of local government areas. While the local government areas are made up of rural and urban settlements, there are a number of major cities/urban settlements among the five administrative states. Today, southeast Nigerian towns captured in the ongoing urbanization of the African socio-geographical landscape lack environmental hygiene. This is reflected in the manner of the architectural design of most cities and emerging cities in the region, which lack ecological wisdom (McGranahan & Satterthwaite, 2014; Douglas, 2008; Henderson, 2010; Johnson, 2001; Xiang, 2016). While the urbanization across the region occurs rather in an inconsistent and mostly unplanned pattern, the behavioural disposition of the inhabitants (urbanism) appears to be unguided by any specific policy or pro-environmental behaviour (UN-Habitat, 2014; Satterthwaite, 2003; Watson, 2009).

Although migration (Beauchemin, & Bocquier, 2004; Hugo, Champion & Lattes, 2003) and population explosion among the African nations play a role in the formation of emerging cities (Hugo, Champion & Lattes, 2003; Zoomers, Van Noorloos, Otsuki, Steel & Van Westen, 2017), socioeconomic policies regarding the formation of urban and peri-urban centres (Buckley & Kallergis, 2014; Currie, 2015; Pieterse, 2011; Fox, 2012) and intra-regional management of natural resources and environment lack an objective definition of environmental orderliness among the inhabitants (Turok, 2015). As such, the majority of the cities are characterized by micro and macro environmental pollution (Ene, 2014; Osuide & Dimuna, 2005; UN Habitat 2014); disorderliness in terms of infrastructural design and locations, which has majorly fallen into the hand of private individuals lacking environmental awareness and ecological wisdom or, at worst, lacking environmental consciousness regarding the general public interest. The major cities in southeast Nigeria can be found in North Africa (UN-Habitat, 2012; Egyptian Environmental Affairs Agency, 2010), West Africa (Bah et al., 2003; Oguweleka, 2009), east Africa (Lwasa, 2010; UN-HABITAT, 2011).

The study was carried out among eight urban settlements with city (some with quasi-city) indices, randomly selected from the five states of the southeast region of Nigeria, among which are Abia, Imo, Anambra, Enugu and Ebonyi States. The eight urban settlements involved in the study are Umuahia and Aba (in Abia state), Onitsha and Awka (in Anambra state), Enugu and Nsukka (in Enugu state), Abakiliki (in Ebonyi state) and Owerri (in Imo state). Among the five south-eastern states, there are about 15 urban settlements with quasi-city indices. While these urban settlements cannot be perfectly characterized as cities, they possess some characteristics giving them an urban

appearance. In the selection of the study site for this study, the researchers applied the balloting technique to select eight settlements for the study, which invariably represented more than half of the classified urban settlements in the region. For equal representative sampling, the study considered the number of urban settlements that can be found in each of the states of which Imo and Ebonyi states appeared to have fewer urban settlements compared to the other states with more commercial cities. Although the researchers applied the systematic random sampling technique in the selection of the study sites, the urban communities selected for the study have the indices of waste mismanagement and indiscriminate environmental pollution (Federal Ministry of Environment, 2020).

The study was carried out between February and March 2021, when the urban settlers have returned from their Christmas holidays, which is the major holiday and season when the urban settlements are usually scanty. The respondents to the study were duly visited based on their locations randomly selected for the study. Adult males and females aged 18 years and older were selected from the eight cities/urban settlements, using inclusive criteria such as individuals that have at least lived in these cities/quasi-cities for five years. Also, their frequency and type of occupation in the city was considered to capture only those who are regular and familiar with these cities. The age cut-off in the study was chosen to stave off minors who may not likely provide the study with relevant information needed as data.

The study adopted a cross-sectional survey design. The choice of this design was in line with the theoretical proposition about the ongoing behavioural exchange on environmental issues among the government agents representing government institutions and the inhabitants of these cities. While the behavioural display on the environment by the government institution as observed by urbanites is a set of variables in relation to the environmental realities and behavioural response from the inhabitants of the cities, these were captured quantitatively in the logic of social survey for empirical evaluation of the substantive issues raised in the study. In essence, in order to empirically evaluate the theoretical proposition, which is on symbolic interactionism and in connection with the behavioural exchange among the government institution on the environment and urban dwellers in the region, the logic of social survey in data collection and analysis is indispensable.

The study adopted both random and modified random sampling techniques in selecting the respondents. While the random sampling technique was adopted at the state's level (the selected eight urban areas), city levels (streets and outlets) and the streets/outlet levels (compound arrangements), modified random sampling was adopted in selecting the respondents (study participants based on the inclusive criteria). All the urban areas/cities selected were equally represented in the study by adopting the equal probability sampling technique. Here, the names of the streets/outlets in each of the selected city/urban areas were labelled from which the study selected five streets/outlets each, bringing together 40 streets/outlets, selected with the simple random sampling technique. Among the 40 streets/outlets selected from the eight cities/urban areas, eight residential compounds[1] were randomly selected, totalling 320 residential compounds. Among the selected 320 residential compounds, two respondents were selected from the available households using modified random sampling to maintain the inclusive criteria. In total, 640 respondents were selected from the randomly selected eight cities/urban areas.

The cities/urban centres, streets/outlets and residential compounds were selected through balloting, using the names of the streets/outlets and the number systems of the residential compounds in different cities/urban centres and streets/outlets. Meanwhile, the selection of the respondents was based on modified random sampling in which the available two adults (male and female) were selected from every chosen compound, using the criteria for participation in the study. The sample size was 640, which was statistically determined using Taro Yamane (1967) statistical formula while

[1] Compound was used here to describe the obtainable living arrangement in this part of the world where the numbered houses in the streets and outlets can contain more than one household, depending on the design of the building in question.

depending on the population of the included urban communities in the five states of the southeast Nigeria geopolitical zone.

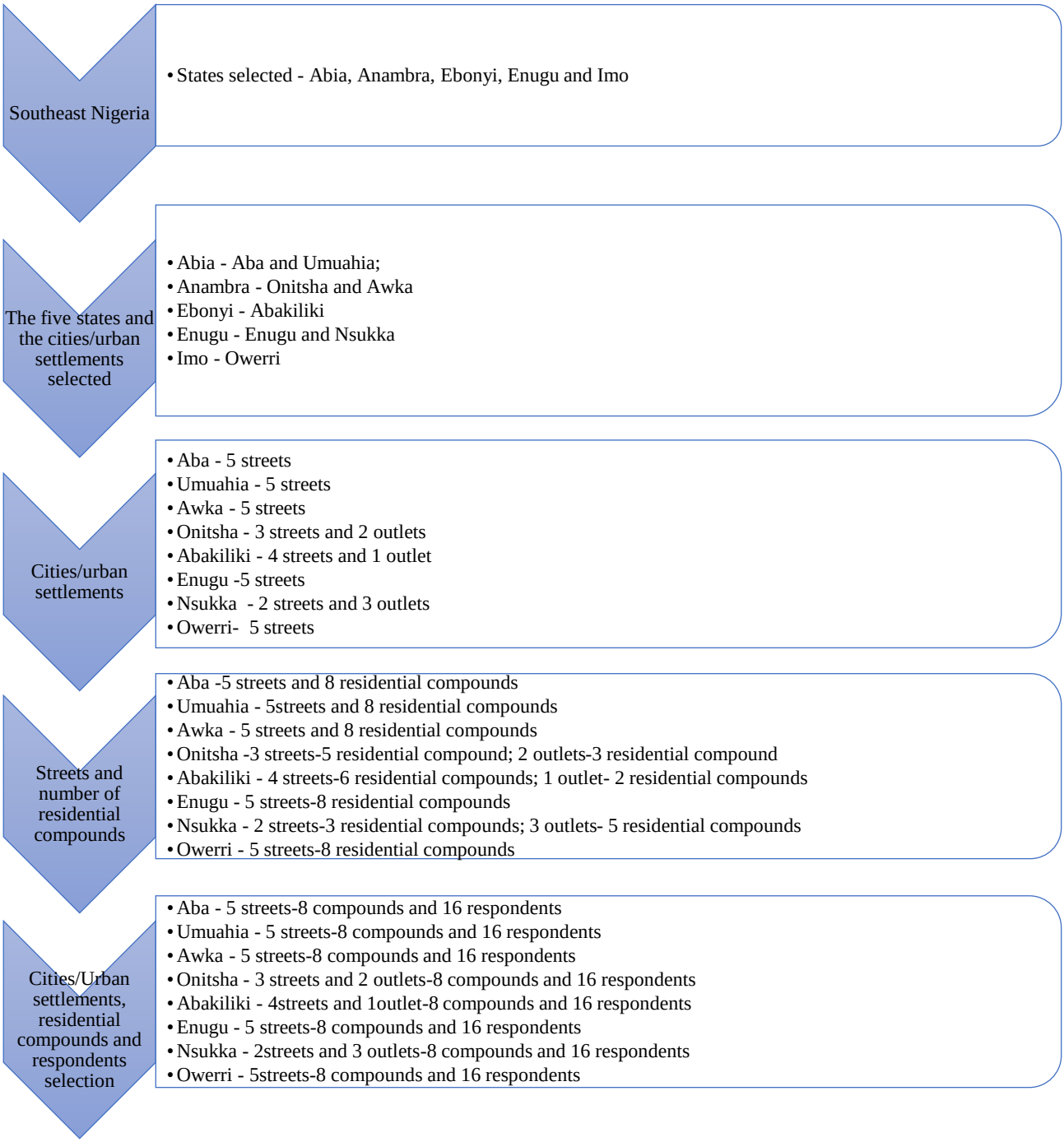

Figure 1. ***Vertical Chevron list displaying the flow of the selection of states, cities/urban settlements, residential compounds and the respondents***
Source: Authors.

The instrument of the study was a survey questionnaire developed on nominal and ordinal scales with a specific focus on the indices of individuals and group interaction on environment-related issues, behavioural exchange between the city/urban dwellers and the government institution on the environment and other substantive issues. The questionnaire instrument was designed by the researchers using relevant information from components of environmental literacy, adapted from Simmons (1995), frameworks for ecological literacy advanced within the field of ecology and

framework of eco-literacy (MCBride et al., 2013) and substantial issues to the study and indices of human behavioural disposition towards the natural environment, public environmental policy and public administration via the governmental institution charged with the protection of the natural environment in Nigeria and southeast Nigeria.

While the first section of the questionnaire focused on the socio-demographic variables of the respondents, the second section of the questionnaire focused on the substantive issues to the study. For the reliability and validity of the instrument, the overall consistency of the questionnaire items was tested with the Cronbach alpha (6.58). However, according to the item by item analysis, the reliability values of the substantive variables are as follows: Awareness of government anti-environmental pollution policy (6.61); Knowledge of the natural environment and environmental protection (6.70); Commitment to protect the natural environment against pollutions (6.49) and Support to the government's environmental agencies in protecting the environment (6.51). The questionnaires were self-administered with some guidance where the respondents requested assistance. The data collected were coded and analysed using Social Science Statically Package (SPSS version 23), while the research questions guiding the study were answered with descriptive and inferential statistics such as percentages and linear regression. The data collection instrument of the study was duly distributed with the help of a well-trained team of research assistants, and the chances of errors in the filling of the questionnaires were minimized as less than one per cent (0.86%) of the questionnaire instrument returned with few errors. The encountered errors were managed in the coding of the data, which invariably controlled the would-be effects since the affected instruments were few. The unforeseen problem of outliers in the regression table was controlled for in the design of the questionnaire instrument, which was developed to suit a linear model table; as such, there were no outliers from the regression table. Equally, the careful coding and loading of the raw data into the SPSS software controlled for the problem of the missing values.

Meanwhile, the study faced some limitations, such as scope, sample size and depth of the instrument for data collection. While there are many other aspects of the challenges of behavioural exchanges between the policy makers and the citizens, the study narrowed down to the aspect of knowledge, commitment and support to environmental policy by the citizens. The sample size for the study does not absolutely represent the opinion of the entire population, limiting the predictive power of the findings from the study. Similarly, the instrument of data collection is limited in depth and width in covering all the behavioural dimensions obtainable in the interaction of the citizens and policy makers.

Study Findings and Analysis

Table 1 below presents the socio-demographic information of the study participants. The majority of the study participants (52.5%) are females, while 47.5% of the respondents are males. In the age distribution of the respondents, the majority (50%) fall in the age categories of 18-23 years, 27.5% belong to the age category of 24-29 years, 10% are in the age category of 30-35years, 7.5% are in the age category of 54years and above, while 5% of the respondents fall in the age category of 30-41 years.

The majority of the respondents (52.5%) have acquired formal education up to the level of Higher National Diploma (HND) and the first university degree. Another 27.5% were only educated to the level of primary education and high/secondary school certificates. 17.5% of the respondents have obtained training to the level of National Certificate in Education (NCE) and National Diploma, while only 2.5% have obtained training up to the level of Master's degree and above. Among the study participants, 37.5% are civil servants, another 37.5% are self-employed, and 20% are unemployed, while five per cent are artisans/traders. 50% of the study participants have lived in the urban setting for more than 15 years, 20% have lived in the city for up to 10 years, and 17.5% have lived in the city for less than 10 years, while 12.5% have lived in the city for up to 15 years.

Table 1. ***Presentation of the socio-demographic information of the respondents***

SOCIO-DEMOGRAPHIC VARIABLES		N	PERCENTAGE (%)
Respondents' gender	Males	304	47.5%
	Females	336	52.5%
Age distribution	18-23	320	50.0%
	24-29	176	27.5%
	30-35	64	10.0%
	36-41	16	2.5%
	42-47	16	2.5%
	54 and above	48	7.5%
Respondents' education	Primary/Secondary education	176	27.5%
	NCE/Diploma	112	17.5%
	HND/Degree	336	52.5%
	MSC and above	16	2.5%
Respondents' occupation	Unemployed	128	20.0%
	Artisan/Trader	32	5.0%
	Civil Servant	240	37.5%
	Self-employed	240	37.5%
Duration of the respondents in the city	Less than 10years	112	17.5%
	Up to 10years	128	20.0%
	Up to 15years	80	12.5%
	More than 15years	320	50.0%
Total		640	100.0%

Source: Authors.

Table 2 below illustrates the substantive issues of the study. As can be seen, 62.5% of the respondents disagreed that cleaning up the drainage system in their surroundings is a necessary responsibility of the government, while 37.5% agreed that it is a necessary duty of the government. On the lifestyle of disposing solid waste outside the public designated waste bin, 52.5% of the respondents disagreed of it being a lifestyle to them, while 47.5% agreed to have experienced such as a lifestyle.

As far as the indiscriminate dropping of refuse along the road is concerned, 40% of the respondents agreed to have experienced this as a lifestyle, while 60% disagreed with it. On the involvement with environmentally hazardous activities, 45% of the respondents agreed that they had been involved in activities that trigger environmental pollution, but 55% stated otherwise. More than 60% of the respondents have no knowledge of any government's anti-environmental pollution targeted to the population, while only 22.5% know of any form of the government's antienvironmental policy. 60% of the respondents have no access to any form of public enlightenment on environmental pollution via the public media, while 40% indicated they had access to such information via public media outlets.

Table 2. ***Substantive Issues to the Study (1)***

QUESTIONNAIRE INDICATORS		N	MARGINAL PERCENTAGE
Seeing drainage cleanup as a necessary government duty	Strongly disagree	208	32.5%
	Disagree	192	30.0%
	Agree	208	32.5%
	Strongly agree	32	5.0%
Disposal of solid waste outside the designated public waste bin as a convenient practice	Strongly disagree	96	15.0%
	Disagree	240	37.5%
	Agree	256	40.0%
	Strongly agree	48	7.5%
The indiscriminate dropping of refuse by the roadside as a convenient practice	Strongly disagree	128	20%
	Disagree	256	40.0%
	Agree	64	10.0%
	Strongly agree	192	30.0%

QUESTIONNAIRE INDICATORS		N	MARGINAL PERCENTAGE
Involvement in environmentally hazardous activities such as air, water and land pollution	Strongly disagree	96	15.0%
	Disagree	256	40.0%
	Agree	128	20.0%
	Strongly agree	160	25.0%
Awareness of the government's antienvironmental pollution policy	Strongly disagree	128	20.0%
	Agree	368	57.5%
	Agree	144	22.5%
Access to enlightenment on environmental protection by the public media within the city	Strongly disagree	112	17.5%
	Disagree	272	42.5%
	Agree	256	40.0%
Total		640	100.0%

Source: Authors.

Table 3 shows that more than 60% of the respondents disagreed that the government's environmental agencies in their various host cities and states are doing their specific work on the protection of the natural environment, while 35% of the respondents indicated that they believe the institution is doing well in their respective host cities and states. 57.5% of the respondents do not trust the genuineness of the government's environmental agencies in their host cities and states, while only 42.5% of the respondents trusted the government's environmental agencies in their respective host cities and states. 60% of the respondents have between good and excellent knowledge of the natural environment and environmental protection, while 40% had between none and partial knowledge of the natural environment and environmental protection.

On the commitment to the protection of the surrounding natural environment, 52.5% of the respondents indicated that they have between good and outstanding commitment to the protection of the natural environment, while 47.5% indicated they had between partial and no commitment to the protection of the natural environment. In terms of the support to the government environmental agencies in the protection of the natural environment, only 27.5% of the respondents had good and excellent support to government environmental protection agencies in their host cities and states. In comparison, more than 70% of the respondents indicated to have partial and no support to government environmental agencies in their respective host cities and states.

Table 3. ***Substantive Issues to the Study (2)***

QUESTIONNAIRE INDICATORS		N	MARGINAL PERCENTAGE
Functionality of the government's environmental agency in doing their specific work	Strongly disagree	144	22.5%
	Disagree	272	42.5%
	Agree	192	30.0%
	Strongly agree	32	5.0%
Public trust of the genuineness of the government's environmental agencies	Strongly disagree	96	15.0%
	Disagree	272	42.5%
	Agree	240	37.5%
	Strongly agree	32	5.0%
Knowledge of the natural environment and environmental protection	Not at all	112	17.5%
	Partially	144	22.5%
	Good	352	55.0%
	Excellent	32	5.0%
Commitment to protect the natural environment against pollution	Not at all	112	17.5%
	Partially	192	30.0%
	Good	304	47.5%
	Excellent	32	5.0%
Support to the government's environmental agencies in protecting the environment	Not at all	160	25.0%
	Partially	304	47.5%
	Good	144	22.5%
	Excellent	32	5.0%

QUESTIONNAIRE INDICATORS	N	MARGINAL PERCENTAGE
Total	640	100.0%

Source: Authors.

Table 3 illustrates that the overall power of the model in explaining commitment to environmental protection is 90.6% (R value), F. value (238.090). In contrast, the individual variables (independent) contained in the model contributed at various levels to the overall explanation. According to the standardized coefficient values (Beta), knowledge of the natural environment contributed the highest value to the model explanatory power (.880), followed by the functionality of the government environmental agencies in doing their specific jobs (-.287), the public trust of the governmentės environmental agencies (.226), etc. According to the t value, there is a positive correlation between all the included variables and commitment to protecting the natural environment among the urbanites save for the variables such as the functionality of the government's environmental agencies, the respondents' educational level and state of residence. The position of each of the variables in relationship with the dependent variable, especially the sociodemographic variables included in the model, for instance, the age of the respondents in the table (b = .150, t = 6.925) points to the valuable contribution of age in the process of adapting to certain civic responsibilities, such as commitment to environmental protection. By implication, the more mature the individuals become in the process of life experiences, the more likely they are to take certain moral and legal obligations as it concerns environmental protection. However, the educational qualifications of the respondents in the model (b = -.115, t = -4.422) point to the existence of extraneous factors, such as the absence of environmental knowledge in the educational curricular at different stages within the southeast Nigeria region. In other words, the knowledge of the natural environment as it appeared on the model (b = .880, t = 37.417) can be the function of the public media enlightenment on environmental protection among the population (b = .098, t = 3.615). Similarly, the position of gender in the model (b = .158, t = 6.737) points to the direction that females are more likely to commit to environmental protection, as can be observed in Table 1 above.

Table 4. ***The Coefficients of commitment to protecting the natural environment against pollution and other variables***

MODEL	UNSTANDARDIZED COEFFICIENTS		STANDARDIZED COEFFICIENTS	T	SIG.	95.0% CONFIDENCE INTERVAL FOR B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	.056	.170		.328	.743	-.278	.389
State of residence	-.033	.017	-.055	-1.925	.055	-.067	.001
City of residence	-.020	.013	-.056	-1.599	.110	-.045	.005
Awareness of the government's antienvironmental pollution policy	-.043	.031	-.034	-1.383	.167	-.104	.018
Access to enlightenment on environmental protection by the public media within the city	.113	.031	.098	3.615	.000	.052	.174
Functionality of the government's environmental agency in doing their specific work	-.287	.026	-.287	-11.007	.000	-.338	-.235
Public trust of the government's environmental agencies	.238	.032	.226	7.550	.000	.176	.301
Knowledge of the natural environment and environmental protection	.874	.023	.880	37.417	.000	.828	.920
Respondents' gender	.263	.039	.158	6.737	.000	.186	.339
Age distribution	.075	.011	.150	6.925	.000	.054	.096

MODEL	UNSTANDARDIZED COEFFICIENTS		STANDARDIZED COEFFICIENTS	T	SIG.	95.0% CONFIDENCE INTERVAL FOR B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
Respondents' education	-.106	.024	-.115	-4.422	.000	-.154	-.059
Respondents' occupation	.002	.017	.003	.146	.884	-.030	.035
Duration of the respondents in the city	-.018	.021	-.026	-.848	.397	-.060	.024
a. Dependent Variable: Commitment to protect the natural environment against pollution							
R= 0.906 (90.6%); R^2= 0.820 (82.0%); Adjusted R^2= 0.817 (81.7%); F= 238.090 & P= .000							

Source: Authors.

Table 5 highlights that the overall power of the model in explaining the relationship between awareness of government anti-environmental pollution policy and other variables is 48.1% (R value), F. value (38.097), while the individual variables (independent) contained in the model contributed at various levels in the overall explanation. According to the standardized coefficient values (Beta), Indiscriminate dropping of refuse by the roadside as a convenient practice contributed the highest value to the model explanatory power (.487), followed by the *Involvement in environmentally hazardous activities such as air, water and land* (-.353), *Disposal of solid waste outside the designated public waste bin as a convenient practice* (.282), etc. According to the t value, there is a positive correlation between all the included variables and awareness of the government's antienvironmental pollution policy and other variables among the urbanites save for *Involvement in environmentally hazard activities such as air, water and land pollution*.

However, one spectacular thing about the findings here is the direction of the relationship between the dependent variable and the independent variables. At the same time, the relationship between awareness of government anti-environmental pollution policy and other variables are in the positive direction save for the *Involvement in environmentally hazardous activities such as air, water and land*; the result points to the fact that the low awareness of the government environmental protection policies encourages antienvironmental behaviours. For instance, only 22.5% of the respondents are aware of any governmental environmental protection policy in their respective host cities and states.

Table 5. ***The Coefficients of awareness of governmental antienvironmental pollution policy and other variables***

MODEL	UNSTANDARDIZED COEFFICIENTS		STANDARDIZED COEFFICIENTS	T	SIG.	95.0% CONFIDENCE INTERVAL FOR B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	.483	.134		3.605	.000	.220	.746
Seeing drainage cleanup as necessarily government duty	.091	.027	.127	3.375	.001	.038	.143
Disposal of solid waste outside the designated public waste bin as a convenient practice	.183	.028	.282	6.557	.000	.128	.237
Indiscriminate dropping of refuse by the roadside as a convenient practice	.421	.050	.487	8.369	.000	.322	.519
Involvement in environmentally hazard activities such as air, water and land pollutions	-.286	.048	-.353	-5.971	.000	-.380	-.192

MODEL	UNSTANDARDIZED COEFFICIENTS		STANDARDIZED COEFFICIENTS	T	SIG.	95.0% CONFIDENCE INTERVAL FOR B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
Support to the government's environmental agencies in protecting the environment	.123	.025	.171	4.829	.000	.073	.173
Dependent Variable: Awareness of government anti-environmental pollution policy and other variables							
R= 48.1%; R^2= 23.1%; Adjusted R^2= 22.5%; F= 38.097& P= .000							

Source: Authors.

Table 6 shows that the overall power of the model in explaining the relationship between knowledge of the natural environment and other variables is 81.8% (R value), F. value (256.838), while the individual variables (independent) contained in the model contributed at various levels in the overall explanation. According to the standardized coefficient values (Beta), *Involvement in environmentally hazardous activities such as air, water and land pollution* contributed the highest value to the model explanatory power (-.544), followed by the *Indiscriminate dropping of refuse by the roadside as a convenient practice* (.526), *Support to government environmental agencies in protecting the environment* (.541), etc. According to the t value, there is a positive correlation between all the included variables and awareness of the government's anti-environmental pollution policy and other variables among the urbanites except the variables *Disposal of solid waste outside the designated public waste bin as a convenient practice* and *Involvement in environmentally hazard activities such as air, water and land pollution*.

However, one outstanding thing about the findings here is the direction of the relationship between the dependent variable and the independent variables. While the relationship between *Knowledge of the natural environment* and other variables are both in the positive as well as negative directions, the result points to the fact that as much as knowledge of the natural environment is likely to trigger pro-environmental behaviour, this is not in all contexts. For instance, knowledge of the natural environment is positively related to the indiscriminate dropping of refuse by the roadside among the urbanites in their respective host cities and states. Equally, the model showed a positive relationship between knowledge of the natural environment and the respondents seeing drainage clean-up as the government's necessary duty. The spurious factor here can be traced to be public awareness of anti-environmental protection policy as well as the functionality of the government environmental protection agencies in these states and cities. For instance, only 22.5% of the respondents are aware of any governmental environmental protection policy in their respective host cities and states, while only 35% of the respondents indicated to have observed the government's environmental agency doing their specific work in their respective host cities and states.

Table 6. ***The Coefficients Knowledge of the natural environment and other variables***

MODEL	UNSTANDARDIZED COEFFICIENTS		STANDARDIZED COEFFICIENTS	T	SIG.	95.0% CONFIDENCE INTERVAL FOR B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	2.009	.113		17.825	.000	1.788	2.230
Seeing drainage clean-up as necessarily government duty	.076	.023	.084	3.384	.001	.032	.121
Disposal of solid waste outside the designated public waste bin as a convenient practice	-.402	.023	-.483	-17.139	.000	-.448	-.356

MODEL	UNSTANDARDIZED COEFFICIENTS		STANDARDIZED COEFFICIENTS	T	SIG.	95.0% CONFIDENCE INTERVAL FOR B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
The indiscriminate dropping of refuse by the roadside as a convenient practice	.583	.042	.526	13.776	.000	.500	.666
Involvement in environmentally hazard activities such as air, water and land pollution	-.565	.040	-.544	-14.025	.000	-.645	-.486
Support to government environmental agencies in protecting the environment	.499	.021	.541	23.349	.000	.457	.541
a. Dependent Variable: Knowledge of the natural environment							
R= 81.8%; R^2= 66.9%; Adjusted R^2= 66.7%; F= 256.838& P= .000							

Source: Authors.

Discussion

The problem of environmental degradation can be found in the sphere of human behavioural disposition towards the natural environment. While the relationship between man and the natural environment cannot be constant because of the juxtaposition of the demand by the healthiness of the environment and the insatiable consumerism of people, the template and sphere of human behavioural disposition towards the natural environment for the protection of the environment are interconnected with time, space and human behavioural control mechanism obtainable among a particular population (Howes et al., 2017; OECD, 2016; Zhao, 2019).

One of the questions the present study set out to answer is the behavioural exchanges on environmental management and sustainability matter between urbanites and the public policy administrators in southeast Nigerian cities. From one of the findings of the study, behavioural exchange towards the natural environment is obtainable hovers around the atmospheres of environmental policy strength, the functionality of the policy implementation institution, the trust between the government and the citizens as well as regular awareness of environmental pollution (see tables 2a&b). While the inhabitants of the urban settlements in southeast Nigeria seem to have commendable knowledge of the natural environment as well as the need to save the environment from pollution through indiscriminate dumping of refuse as can be seen in Tables 2a and b above, the policy framework, as well as implementation processes, seem to be weak to command the morality of the population in responding to pro-environmental public policies (see Table 2b above). The correlation of these variables in Tables 3 and 5 above show their impact on the support to the government in the protection of the natural environment as well as a commitment to the protection of the natural environment. Although other scholars researching in Nigeria's southeast region on similar issues have recorded the indiscriminate anti-environmental behaviour among the citizens, traceable through their attitude to the management of waste around them (Nwagbara et al., 2012; Nnaemeka-Okeke, 2014; Chukwuemeka, Igwegbe & Ugwu, 2012; Ndinwa, Akpafun, Chukwuma & Nwakaego, 2012), the present study went a step ahead to understand the circumstances generating this behaviour, which is found within the web of behavioural exchange between the citizens and the authorities in charge of environmental protection anchored on policy and public administration issues. This is captured in the libertarian paternalism model propounded by Thaler and Sunstein (2003), which maintains that it is both possible and legitimate for public and private institutions to affect behaviour while also respecting the freedom of choice as in the process of exercising the paternalistic principle. In any case, our findings indicate that while the freedom to opt into policy framework guiding the environmental management among this population is somehow taken for granted among the population, the institutional framework on environmental management is weak and poorly

implemented of the libertarian aspect of the libertarian and paternalistic principle (Kniess, 2021; Willis, 2013).

Our findings indicate that more than 60% of the respondents perceived the government's environmental agencies (institutions) in their respective host cities and states as weak and not functional. In comparison, more than 57% of the respondents do not trust the environmental protection agencies (institutions) as genuine in their respective duties. These findings of this study displayed a form of behavioural exchange observable in the commitment to protect the natural environment and the support of the government agencies charged with the responsibilities of natural environmental protection. For instance, 47% of the respondents either partially commit or do not commit themselves to environmental protection, while more than 70% of the respondents partially support or do not support the government's environmental agencies in their various host cities and states. From the findings of other studies, the administration of the public institutions, especially the agencies charged with environmental management, seems to lack consistency in the management and implementation of public policies, especially in the developing nations (Nuesiri, 2016; UNDP, 2016; Yagboyaju & Akinola, 2019).

The commitment to protect the natural environment among the citizens, as this study set to understand (see research question 2 above), goes beyond the moral responsibility to include some other factors with empirical relationships. Among other factors, which can affect commitment to the protection of the natural environment, the study found a relationship between commitment to the protection of the natural environment and age, sex, knowledge of the natural environment, trust of the government environmental agencies, the functionality of the government environmental agencies, etc. However, the spectacular thing here is the negative relationship between educational attainments, state of residence and the functionality of the government environmental agencies and commitment to environmental protection among the urbanites (see Table 3 above). The finding here specifically displayed the implication of weak public policy design/implementation, weak administration in the public institution and urbanites' commitment to protecting the natural environment, irrespective of the commendable level of education, knowledge of the natural environment and willingness to protect the natural environment among the population (see Tables 1-2b above). This finding affirmed the findings of other studies on public environmental policies among the developing nations by other researchers, such as Leitao (2016), Avis (2018) and Wang et al. (2020). While the extraneous variable between the educational attainment and the commitment to protect the natural environment can be traced to the covert exclusion of environmental knowledge from the curriculum of almost all stages of educational training in Nigeria, the extraneous variable between the functionality of the government's agencies, state of residence and the commitment to protect the natural environment can be traced to the behavioural exchange between the government and the urbanites with the environment as the central piece. This is captured in the libertarian paternalism model propounded by Thaler and Sunstein (2003), which indicates that the policy makers and implementers sometimes believe that human beings would behave rationally in reaction to policy interventions contrary to the empirical realities that people tend not to act like Homies Oeconomici but face limitations in their mental resources (such as will power, computational capacity and memory) leading to predictable biases (Kuehnhanss, 2018, DellaVigna, 2009; Kahneman & Tversky, 2000).

While the observed weak policy framework and implementation process seem to discourage pro-environmental protection behaviour among the urbanites, knowledge of the surrounding natural environment could not discourage indiscriminate environmental pollution behaviour equally because of the weak policy framework and policy implementation. By implication, the behavioural exchange obtainable in the southeast Nigerian cities is capable of countering environmental sustainability in view of the fact that from micro to macro-environmental pollution, man is the measure. More importantly, the finding here negates the findings of other researchers, such as Liobikien et al. (2019), Yusliza et al. (2020), Gkargkavouzi et al. (2018) and Handoyo et al. (2021), who have found positive correlations between knowledge of the natural environment and pro-environmental behaviour. As can be seen in this study, the differences between the aforementioned finding and other studies mentioned

above are observable in the extraneous variable of weak public policy administration in the public institution charged with environmental management.

Conclusions

While the fluid relationship between urbanism and urbanization concepts prevails, the realities of these concepts in their specific manifestations are visible in different domains of social problems where they surface. On the environmental challenges of the current historical epoch, urbanism and urbanization concepts have surfaced in the developmental quest of every nation, especially among the African nations. Across human history, urbanism and urbanization concepts have operated in the African socioeconomic and geographical landscape as the ancient cities and behavioural dispositions of the inhabitants. More importantly, as this paper determined to unveil, the antecedents of the behavioural dispositions found in the ancient and emerging cities in Africa, with regard to micro and macro environmental hygiene, are more of the dominant socioeconomic sphere of the time and subsequent cultural diffusion that lacked discipline about environmental hygiene. The spillover of the aforementioned sphere equally engulfed the emerging African cities and the issue of urbanization. In a give-and-take relationship as the libertarian paternalism theoretical framework by Thaler and Sunstein (2003) unveiled, the inhabitants of the cities, as can be seen from the cities in southeast Nigeria, respond to the symbolic gesture from the elite class (i.e., the political class), which in itself lacks the substance of environmental consciousness. As a way of pursuing sustainable development as encapsulated in the sustainable development goals, building a society with some level of ecological wisdom across the African nations via urbanization and other socioeconomic policies is essential. Bringing urbanites into the trajectory of environmental literacy and ecological wisdom via policy strategies will inspire involuntary and voluntary participation in the war against environmental abuse/pollution across the urban settings in southeast Nigeria and perhaps other African nations. Notwithstanding, the present study has made a number of findings, which filled the gap in the literature on policy and natural environmental management among the urban settlers. These findings were answers to the research questions, which this study set out to answer. Among the findings, the behavioural exchange between the urban settlers and the public policy administrators reflects in mistrust and poor policy and the institutional framework; commitment to protect the natural environment among the urban dwellers is affected by the poor synergy of the public institution charged with environmental protection, leading to the altered relationship between the support to public environmental policy and commitment to protecting the natural environment. The findings from this study have contributed to filling the gap in knowledge in the areas of environment and public policy. In the quest to understand the relationship between human behaviour and environmental sustainability, researchers have focused on the implications of public perception of the natural environment as well as the attitude towards pro-environmental policies. However, as a milestone, the present study narrowed down to the individual and group commitment to environmental protection via policy support and pro-environmental behaviour creating some wider views of the factors facilitating and militating against environmental sustainability, especially in the developing nations. All these have severe implications to the public policy administration in the public institution responsible for the management and protection of the natural environment and anti-public policy behaviour. Equally, the initiation and implementation of public environmental policies ought to put into perspective the opera condition of the urbanites for more pragmatic policy design and implementation. The era of technical approach to public policy seems to have ended with the emergence of globalization, which has empowered the citizens across the globe to exercise the libertarian principle in approaching public policies, highlighting the need for the nudging principles associated with the refined approach to the libertarian paternalistic policy principle (Kniess, 2021; Willis, 2013). More importantly, in terms of policy and environmental sustainability, the findings of this study call for a path of inclusive public policy making and implementation on environmental issues since the policy may become redundant in the absence of the people's willingness and commitment. Based on the findings of this study and the limitations of the study due to the specific

objectives set out to achieve, there is a need for further research on the perception of public policy implementation and urban settlers among the public administrators of the public institutions as well as public perceptions of policy making and implementation approaches among urban settlers in the region and the rest of Africa.

References

1. Adams R. M. C. (1966). The Evolution of Ur ban Society: Early Mesopotamia and Pre Hispanic Mexico. Chicago: Aldine.
2. African Development Bank, OECD & UNDP (2016). *African Economic Outlook 2016: Sustainable Cities and Structural Transformation*. Paris: OECD Publishing.
3. Agergaard, J., Fold, N., & Gough, K. (Eds.) (2010). *Rural-urban dynamics: Livelihoods, mobility and markets in African and Asian Frontiers*. London and New York: Routledge.
4. Agunwamba, J. (1998). Solid waste management in Nigeria: Problems and issues. *Environmental Management*, 22(6), 849-856.
5. Ahmed, A. (2011). Urbanisation and the Challenges of development. *Journal of sustainable development in Africa 13, (7) 210 -235.*
6. Alcock SE, D'Altroy TN, Morrison KD, Si nopoli CM, eds. (2001). Empires: Perspectives from Archaeology and History. Cambridge: Cambridge Univ. Press.
7. Allison PM, ed. (1999). *The Archaeology of Household Activities*. London: Routledge.
8. Avis, W. R. (2018). Inclusive green growth in developing countries. K4D Helpdesk Report. Brighton, UK: Institute of Development Studies.
9. Babayemi, J., & Dauda, K. (2009). Evaluation of solid waste generation, categories and disposal options in developing countries: a case study of Nigeria. *Journal of Applied Sciences and Environmental Management,* 13(3).
10. Bah, M., Cissé, S., Diyamett, B. Diallo, G., Lerise, F., Okali, D., Okpara, E., Olawoye, J., & Tacoli, C. (2003). Changing rural-urban linkages in Mali, Nigeria and Tanzania, *Environment and Urbanization,* 15, (1), 13-24.
11. Ballard, M. and M. Pandya. (1990). *Essential learnings in environmental education*. North American Association for Environmental Education, Troy, Ohio, USA.
12. Bard, K. (1997). *Urbanism and the rise of complex society and the early state in Egypt. In Emergence and Change in Early Urban So cities*, (ed). L Manzanilla. New York: Plenum Press.
13. Beauchemin, C. & Bocquier, P. (2004). Migration and urbanization in Francophone West Africa: a review of the recent empirical evidence', *UrbanStudies*, 41, (11): 2245-2272.
14. Beckinsale, R.P. (1970), *Urbanisation and its Problems,* Oxford: Blackwell.
15. Berg, N. & Gigerenzer G. (2010). As-if behavioural economics: neoclassical economics in disguise? *History of Economic Ideas* 18 (1) 133-166.
16. Berkowitz, A. R. (1997). Defining environmental literacy: a call for action. *Bulletin of the Ecological Society of America* 78:170–172.
17. Berkowitz, A. R., Ford, M. E. & Brewer C. A. (2005). A framework for integrating ecological literacy, civics literacy, and environmental citizenship in environmental education. Pages 227–265 In Johnson E. A. & Mappin M. J., (eds.) *Environmental education or advocacy: perspectives of ecology and education in environmental education.* New York: Cambridge University Press.
18. Blanton R. E. (1976). Anthropological studies of cities. *Annu. Rev. Anthropol*. 5:249-64.
19. Bloch, Robin. (2014) Africa's New Suburbs. In Hamel P., Keil R, eds., *Suburban Governance. A Global View*. Toronto: University of Toronto Press.
20. Bolay, J. C., & Rabinovich, A. (2004). Intermediate cities in Latin America: risk and opportunity of coherent development. *Cities*, 21, 407–421.
21. Breeze, G. (1966), *Urbanisation in Developing Societies.* New Jersey: Prentice-Hall.
22. Breeze, G., ed. (1969). *The City in Newly-Developing Countries*, New Jersey: Prentice-Hall.
23. Brewer D.J,& Teeter E. (1999). *Egypt and the Egyptians*. Cambridge: Cambridge Univ. Press.
24. Briggs, D. (2000). *Environmental Health Hazard Mapping for Africa*. Harare: WHO-AFRO.
25. Buckley, R. & Kallergis, A. (2014). Does Africa Urban Policy Provide a Platform for Sustained Economic Growth? In: Parnell S. & Oldfield S. (ed.). *The Routledge Handbook on Cities of the Global South*. New York & London: Routledge.
26. Burgess E. W. (ed.) (1926). A Redefinition of 'City' in Terms of Density of Population.
27. Butland B., Jebb S., Kopelman P., McPherson K., Thomas S., Mardell J & Parry V. (2007) *Tackling Obesities: Future Choices* Foresight Group, London, Government Office for Science http://www.foresight.gov.uk/Obesity/17.pdf.
28. Capra, F. (1997). The web of life: a new scientific understanding of living systems. New York: Anchor Books.
29. Carpenter D. B. (1932). The Sociology of City Life, New York: Doubleday/Natural History Press.
30. Castells, M. & Himanen, P. (2014). *Re-conceptualizing Development in the Global Information Age*. Oxford: Oxford University Press.

31. Cherrett, J. M. (1989). Key concepts: the results to a survey of our members' opinions. In Cherrett J. M., (ed.) Ecological concepts. London: Blackwell.
32. Choi, J., Laibson, D., Madrian, B. C. & Metrick, A. (2002). Defined Contribution Pensions: Plan Rules, Participant Decisions, and the Path of Least Resistance," in James M. Poterba, ed., *Tax policy and the economy*. Cambridge, MA: MIT Press.
33. Chukwuemeka, E., Igwegbe, D. & Ugwu, J. (2012). Management and Development Implications of Solid Waste Management in Nigeria. *Asian Journal of Business Management*, 4. 352-358.
34. Cowgill GL. (1988). Onward and upward with collapse. In Yoffee, N. & Cowgill, G.L. (ed.) *The Collapse of Ancient States and Civilizations*. Tucson: Univ. Ariz. Press
35. Coyle, K. (2005). Environmental literacy in the U.S.: what ten years of NEETF/Roper research and related studies say about environmental literacy in the United States. National Environmental Education and Training Foundation (NEETF), Washington, D.C., USA.
36. Crutzen, P.J. (2002). The Anthropocene: Geology and Mankind. *Nature*, 415:23.
37. Currie, P.K. (2015). *A Resource Flow Typology of African Cities*. Stellenbosch:Stellenbosch University Press.
38. Cutter-Mackenzie, A. & Smith R. (2003). Ecological literacy: the 'missing paradigm' in environmental education (part one). *Environmental Education Research* 9:497–524.
39. Daramola, A. & Eziyi O. I.(2010). Urban Environmental Problems in Nigeria: Implications for Sustainable Development. *Journal of Sustainable Development in Africa* 12 (1), 124-145.
40. De Briey, P. (1970). Urbanization and Under-development, *Civilizations*, 15, (4), 2-14.
41. Della, V. S. (2009). Psychology and economics: Evidence from the field. *Journal of Economic Literature*, 47(2), 315–372.
42. Douglas, I. (2008). Environmental Change in Peri-Urban Areas and Human and Ecosystem Health. *GeographyCompass* 2(4): 1,095–091,137.
43. Dr.Ikoro, Ibekwe Stanley Ezeanyim,Uchechukwu.Elizabeth
44. Durkheim E. 1984. (1938). *The Division of Labor in Society.* New York: Free Press.
45. Egyptian Environmental Affairs Agency. (2010). *Egypt Second National Communication under the United Nations Framework Convention on ClimateChange.*Cairo: EEAA.
46. Eidinow, E. (2016). Telling Stories: How myths relate to ecological wisdom. *Landscape and Urban Planning, 155, 47–52*.
47. Eko, A.J., Ayama, O.R., Eni, D.I., Eja, E.I. & Esien, O.E. (2012). The Effects of Urban Sprawl on Peripheral Agricultural Lands in Calabar, Nigeria. *International Review of Social Sciences and Humanities*, 2(2), 68-76.
48. Ene, R. N. (2014).Environment Hygiene in the Nigerian Urban Cities (A Case Study of Enugu Urban) *International Journal of Environmental Science and Development.*5,(4),336-339.
49. Eneh, O. C. & Agbaeze, V. C. (2011).Protection of Nigeria's environment: A critical policy review. *Journal of Environmental Science and Technology (4*), 490-497.
50. Eneh, O.C. & Anamalu, N. P. (2012). Municipal Solid Waste Management in Enugu: The Challenge of Public Participation. *Sustainable Human Development Review* (4).
51. Falconer SE, Savage SH. (1995). Heartlands and hinterlands: alternative trajectories of early urbanization in Mesopotamia and the southern Levant. *Am. Antiq*. 60(l):37-58.
52. Faust, J. L. (1969). About environmental literacy. *New York Times* April 13:39.
53. Fox, S. (2012). 'Urbanization as a global historical process: Theory and evidence from Sub-Saharan Africa', *Population and Development Review*.38 (2): 285-310.
54. Fu, X.,&Wang, X.(2016).Ecologicalwisdomasbenchmarkinplanning and design. *Landscape and Urban Planning*, 155, 79–90.
55. Furnivall, J.S. (1948), *Colonial Policy and Practice,* London:Cambridge University Press.
56. Garnsey P. (1988). *Famine and Food Supply in the Graeco-Roman World*. Cambridge: Cam bridge Univ. Press
57. Genet, B. & Kassahun, G. (2021). Nexus between perceptions of urban environmental planning and solid waste management practices in Debre Markos Town, Amhara Region, Northwest Ethiopia. *African Journal of Science, Technology, Innovation and Development*, DOI: 10.1080/20421338.2021.1950109
58. Gilovich, Thomas; Griffin, Dale and Kahneman, Daniel, **(**eds.) (2002). *Heuristics and biases: The psychology of intuitive judgment*. Cambridge, U.K.: Cambridge University Press.
59. Ginsburg, N. (1973), 'From Colonialism to National Development: Geographical Perspectives on Patterns and Policies', *Annals of the Association of American Geographers*, 63, 1-21.
60. Gkargkavouzi A., Halkos G. & Matsiori S. (2018). Teachers' environmental knowledge and pro-environmental behavior: An application of CNS and EID scales. MPRA Paper 84505, University Library of Munich, Germany.
61. Golley, F. B. (1998). *A primer for environmental literacy*. New Haven: Yale University Press.
62. Goodey, B. (1971). *Perception of the Environment*, Birmingham:Centre for Urban and Regional Studies,
63. Handoyo, B., Astina, I. K. & Mkumbachi, R. L. (2021). Students' environmental awareness and pro-environmental behaviour: preliminary study of geography students at state university of malang. IOP Conf. Ser.: *Earth Environ. Sci*ence.
64. Hart, P., and K. Nolan. (1999). A critical analysis of research in environmental education. *Studies in Science Education* 34:1–69.

65. Henderson, J.V. (2010). Cities and Development. *Journal of Regional Science* 50(1):515–540.
66. Hopkins K. (1978). Economic growth and towns in classical antiquity. In Abrams P., & Wrigley E. A, (ed.) *Towns and Societies*, Cambridge: Cambridge Univ. Press
67. Howes, M., Wortley, L., Potts, R, Dedekorkut-Howes, A., Serrao-Neumann, S., Davidson, J., Smith, T. & Nunn, P. (2017). Environmental Sustainability: A Case of Policy Implementation Failure? *Sustainability* 2017, 9, 165; doi:10.3390/su9020165
68. Hugo, G., A. Champion, and A. Lattes. (2003). Toward a New Conceptualization of Settlements for Demography. *Population & Development Review* 29(2):277–297.
69. Hungerford, H. R., T. Volk, R. Wilke, R. Champeau, T. Marcikowski, T. May, W. Bluhm, and McKeown R. (1994). *Ice (Environmental Literacy Consortium). Environmental literacy framework.* Illinois: Environmental Education Literacy Consortium.
70. Ikoro, I. S. & Ezeanyim, U. E. (2016). Assessment of secondary school science teachers' knowledge of climate change in the south east Nigeria, for inclusion in the secondary school curriculum. *International Journal of Weather, Climate Change and Conservation Research*, 2, (3), 9-19.
71. Iozzi, L., D. Laveault, and T. Marcinkowski. (1990). *Assessment of learning outcomes in environmental education*. Paris: UNESCO. *Iran J. Environ. Health. Sci. Eng.* 6, (3), 173-180.
72. John, P., Smith, G. & Stoker G. (2009). Nudge nudge, think think: two strategies for changing civic behavior. *The Political Quarterly* 80 361-370.
73. Johnson, M.P. (2001). Environmental impacts of urban sprawl: a survey of the literature and proposed research agenda. *Environment and Planning A* 33(4):717–735.
74. Jordan, R., F. Singer, J. Vaughan, & Berkowitz A. (2009). What should every citizen know about ecology? *Frontiers in Ecology and the Environment* 7:495–500.
75. Kahneman, D., & Tversky, A. (2000). *Choices, Values, and Frames*. New York, NY: Cambridge University Press.
76. Kahneman, Daniel and Tversky, Amos, **(**eds.) (2000). *Choices, values, and frames*. Cambridge,
77. Kankara, A. I. (2013).Examining Environmental Policies and Laws in Nigeria. *International Journal of Environmental Engineering and Management*. 4, 3 (3), 165-170.
78. King A. D (1976). *Colonial Urban Development: Culture, Social Power and Environment* London: Routledge & Kegan Paul.
79. Kjellstrom, T & Mercado. S (2008). Environment and Urbanisation. *International institute for Environment and development. (IED) 20 (2) 551 – 574.*
80. Klaufus, C., & Jaffe, R. (2015). Latin American and Caribbean Urban Development. *European Review of Latin American and Caribbean Studies*, 100, 63–72.
81. Klemow, K. M. (1991). Basic ecological literacy: a first cut. *Ecological Society of America Education Section Newsletter* 2:4–5.
82. Klick J. Mitchell G. (2006). Government regulation of irrationality: moral and cognitive hazards.
83. Kniess, J. (2021). Libertarian Paternalism and the Problem of Preference Architecture. *British Journal of Political Science* 1–13. https://doi.org/10.1017/S0007123420000630.
84. Kuehnhanss, C. R. (2019). The challenges of behavioural insights for effective policy design, *Policy and Society*, 38:1,14-40,DOI: 10.1080/14494035.2018.1511188.
85. Lacovara P. (1997). *The New Kingdom Royal City*. New York: Kegan Paul
86. Lake A. & Townshend T. (2006). Obesogenic environments: exploring the built and food environments. *The Journal of the Royal Society for the Promotion of Health* 126, 262-267.
87. Lamond, J., Awuah B. K., Lewis E., Bloch R., & Falade, B. J. (2015). *Urban Land, Planning and Governance Systems in Nigeria*. Urbanisation Research Nigeria (URN) Research Report. London: ICF International.
88. Le Grand J. (2008). The giants of excess. *Journal of the Royal Statistical Society* 171 843-856
89. Lee, R. (1976). Demographic Forecasting and the Easterlin's Hypothesis. Population and development Review (2),459-68.
90. Leitao, A. (2016). Corruption and the Environment. *Journal of Socialomics* 5:173. doi:10.4172/2167-0358.1000173.
91. Liobikien, G. & Poškus, M. S. (2019). The Importance of Environmental Knowledge for Private and Public Sphere Pro-Environmental Behavior: Modifying the Value-Belief-Norm Theory. *Sustainability* 2019, 11, 3324; doi:10.3390/su11123324.
92. Louis W. (1938). Urbanism as a Way of Life. *American Journal of Sociology, 44, (1)*1-24.
93. Lvovsky, K., Hughes, G., Maddison, D., Ostro, B. & Pearce, D. (2000). *Environmentalcosts of fossil fuels: A rapid assessment methodwith application to six cities*. (Working Paper No.78). Washington, D.C.: World Bank Environment Department.
94. Lwasa, S. (2010). Adapting urban areas in Africa to climate change: the case of Kampala, *CurrentOpinion in Environment and Sustainability*, 2: 166-167.
95. Lyons, M., Smuts, C., & Stephens, A. (2001). Participation, empowerment and sustainability: (How) do the links work? *Urban Studies*, 38(8),1233-1251.
96. Mack A. (2002). *Spiritual Journey, Imperial City: Pilgrimage to the Temples of Vijayanagara*. New Delhi: Vedams.
97. Maiyaki, M. A., Marzuki, A. & Ahmed, A. A. (2020) Urban solid waste development: A review of Nigeria's waste management policy. *International Transaction Journal of Engineering, Management & Applied Sciences &*

Technologies. Management in Africa. In: Minderman G., Raman V., Cloete F. & Woods G. (Ed.). *Good, Bad and Next in Public Governance*. The Hague: Eleventh International Publishing.
98. Marcinkowski, T. (1991). The relationship between environmental literacy and responsible environmental behavior in environmental education. In M. Maldague, (ed.) *Methods and techniques for evaluating environmental education*. Paris: UNESCO.
99. Marcus J, Flannery KV (1996). *Zapotee Origins of Urbanism and Civilization: How Urban Society Evolved in Mexico's Oaxaca Valley*. New York: Thames & Hudson.
100. Marx, K. Engels, F. (1976). *The German Ideology*. Moscow: progress.
101. Mbah, P. O. & Nzeadibe, T. C. (2017). Inclusive municipal solid waste management policy in Nigeria: engaging the informal economy in post-2015 development agenda. *Local Environment,* 22 (2)203-224, DOI: 10.1080/13549839.2016.1188062.
102. McBeth, B., H. Hungerford, T. Marcinkowski, T. Volk, and R. Meyers. (2008). *National environmental literacy assessment project: year 1, national baseline study of middle grades students—final research report.* Washington, D.C: Environmental Protection Agency.
103. Mcbride, B. B., Brewer, C. A., Berkowitz, A. R. & Borrie W. T. (2013). Environmental literacy, ecological literacy, ecoliteracy: What do we mean and how did we get here? *ECOSPHERE 4(5)*1-20.
104. McGranahan, G. & Satterthwaite, D. (2014). *Urbanization concepts and trends Urbanization concepts and trends*. IIED Working Paper. London:International Institute for Environment and Development.
105. McHarg, I. L. (1969). Design with nature. New York: Doubleday/Natural History Press.
106. Mclntosh RJ. (1991). Early urban clusters in China and Africa: the arbitration of social ambiguity. *Field Archaeol*. 18:199-212.
107. Mclntosh RJ. 1998. The Peoples of the Middle Niger. Oxford: Blackwell.
108. Mead G. H. (1934) *Mind, Self, and Society from the Standpoint of a Social Behaviorist.* Chicago: Universityof Chicago Press.
109. Millon R. (1992). Teotihuacan studies: from 1950 to 1990 and beyond. In Berlo J.C (ed.) *Art, Ideology, and the City of Teotihuacan*. Washington, DC: Dumbarton Oaks.
110. Ministry of Environment (2016). National Policy on the Environment (Revised 2016) Examining Environmental Policies and Laws in Nigeria. Abuja: Ministry of Environment. *Minnesota Law Review* 90 1620-1663
111. Murray M. A. (1949). The Splendor That Was Egypt, New York: Doubleday/Natural History Press.
112. Ndinwa, C.C. G., Akpafun, A.S., Chukwuma, C.O. & Nwakaego, P. (2012). Improving Municipal Waste Disposal through Integrated Waste Management the Southern Nigeria Experience, *Journal of EnvironmentalSciences and Resource Management*, 4, Cenresin Publications.
113. Nigel, B., Perez-Padilla, R., & Albalak, R. (2000). Indoor air pollution in developing countries: a major environmental and public health challenge. *Environment and Health*, 78(9), 1078-1092.
114. Nnaemeka-Okeke, R. (2016). Urban Sprawl And Sustainable City Development In Nigeria. Journal of Ecological Engineering 17 (2), 1–11. DOI: 10.12911/22998993/62277de
115. Nuesiri, E. O. (2016). Accountability of Powerful Actors for Social and Environmental Outcomes. NRGF Conceptual Paper. Gland, Switzerland: IUCN and CEESP.
116. Nwagbara, E. Abia, R. Inyang, F & Eleje, J. (2012). Poverty, Environmental Degradation and Sustainable Development: A discourse. *Global Journal of Human social science, sociology, economics and Political science.*
117. Nwokocha, G. (2012). *Managing household solid waste,* Onitsha J.D. publication.
118. O'Brien, S. R. M. (2007). *Indications of environmental literacy: using a new survey instrument to measure awareness, knowledge, and attitudes of university aged students.* Dissertation 1446054. Iowa State University, Ames, Iowa, USA. Proquest UMI Dissertations Publishing.
119. O'Donoghue, T. & Rabin, M. (2003). Studying Optimal Paternalism, Illustrated by a Model of Sin Taxes. *American Economic Review*, May 2003 (*Papers and Proceedings*), *93*(2), 186–91.
120. Obidimma C. E. & Olorunfemi, A. (2011). Resolving the gully erosion problem in Southeastern Nigeria: Innovation through public awareness and community-based approaches. *Journal of Soil Science and Environmental Management.* 2(10), 286-291.
121. Odey, E., Abo, B., Li, Z., Zhou, X. & Giwa, A. (2018). Influence of climate and environmental change in Nigeria: a review on vulnerability and adaptation to climate change. *Reviews on Environmental Health*, *33*(4), 441-447. https://doi.org/10.1515/reveh-2018-0043.
122. Odum, E. P. (1992). Great ideas in ecology for the 1990s. *BioScience* 42:542–545.
123. OECD (2016). Better Policies for Sustainable Development 2016: A New Framework for Policy Coherence, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264256996-en.
124. Ogbosu, I. & Anga, R. A. (2015) Environmental Degradation And Sustainable Economic Development In Nigeria: A Theoretical Approach.*Researchjournali's Journal of Economics*3 (6), 1-13
125. Ogunba, A. (2016).An appraisal of the evolution of environmental legislation in Nigeria *Vermont Law Review* 40 (673), 674-694.
126. Ogwueleka, T.C. (2009). Municipal Solid Waste Characteristics and Management in Nigeria, *Iran Journal of Environmental Health Sciences,* 6 (3) 173-180.

127. Okoli, C., Egobueze, A., & Briggs, D. A. (2020) Waste management policy implementation in Nigeria: A study of Rivers state waste management agency. *International Journal of Advanced Research,* ResearchGate.
128. Okwesili, J. & Ndukwe, C. & Nwuzor, C. I. (2016).Urban Solid Waste Management and Environmental Sustainability in Abakaliki Urban, Nigeria. *European Scientific Journal* 12(23), 155-183
129. Onwughara, I.N., Nnorom, I.C., and Kanno, O.C. (2010). Issues in Roadside Disposal Habit of Municipal Solid Waste Environmental Impacts and Implementation of Sound Management Practices in Developing Country "Nigeria", *International Journal of Environmental Sciences andDevelopment,* 1, (5).
130. Opukri C, Ibaba I (2008). Oil induced environmental degradation and internal population displacement in the Nigeria's Niger Delta. *J. Sustain. Dev. Afri*., 10 (1), 173-193.
131. Orr, D. W. (1992). Ecological literacy: education and transition to a postmodern world. New York: Albany Press.
132. Osuide S. O. & Dimuna K. O. (2005). None compliance with building bye-laws and regulations in Nigeria – the dangers ahead, *The Built Environment Journal of International Institute for Building Research.* 1, (1), pp. 62-68, 2005.
133. Papadimitriou, E., Neves, A. R. & Saisana, M. (2020). *JRC Statistical Audit of the 2020 Environmental Performance Index*. EUR 30234 EN, Publications Office of the European Union, Luxembourg, 2020, ISBN 978-92-76-19125-4, doi:10.2760/849820, JRC120879.
134. Parnell, S. & Pieterse, E. (eds.) (2014). *Africa's urban revolution*. London: Zed Books.
135. Patten, D.(2016). The role of ecological wisdom in managing for sustainable interdependent urban and natural ecosystems. *Landscape and Urban Planning*, 155, 3–10.
136. Pieterse, E. (2011). Recasting urban sustainability in the south, *Development*, 54, (3), 309-316.
137. Powers, J. (2010). Building a lasting foundation in ecological literacy in undergraduate, non-majors courses. *Nature Education Knowledge* 4:53.
138. Quinn, J. A. (1950). Human ecology centers in the study of relations between man and environment. Human Ecology, New York: Doubleday/Natural History Press.
139. Redman, C. L. (1999). Human impact on ancient environments. Tucson, Arizona: TheUniversity of Arizona Press.
140. Rees, W. (1992). Ecological footprints and carrying capacity: What urban economics leaves out. *Environment and Urbanization*, 4(2), 121-130.
141. Ritzer. G. (2011). *Sociological theory* 7th edition. New York: McGraw Hill.
142. Rolf, L. & Claire W. (2016). Conceptual innovation in environmental sociology.*Environmental Sociology*, 2:4, 307-311, DOI: 10.1080/23251042.2016.1259865
143. Roth, C. E. (1992). *Environmental literacy: it's roots, evolution, and direction in the 1990s*. Ohio: Clearinghouse for Science, Mathematics, and Environmental Education, Columbus.
144. Sánchez M. J. & Lafuente, R. (2010). Defining and measuring environmental consciousness. *Revista Internacional de Sociología 68 (3)*, 731-755,
145. Sanders WT, Parson JR, Santley RS. (1979). *The Basin of Mexico: Ecological Processes in the Evolution of a Civilization*. New York: Academic.
146. Satterthwaite, D. (2003). The Millennium Development Goals and urban poverty reduction: great expectations and nonsense statistics. *Environment and Urbanization* 15(2): 181-90.
147. Sawyer, L. (2014) Piecemeal Urbanisation at the Peripheries of Lagos, African Studies, DOI:10.1080/00020184.2014.925207.
148. Schmidt, A. (2017). The power to nudge. *American Political Science Review* 111(2), 404–417.
149. Schwela, D. (2007). *Review of urban air quality in Sub-Saharan Africa. Clean Air Initiative in Sub-Saharan African cities*, Washington DC: The World Bank.
150. Simmel, G. (1969). The Metropolis and Mental Life. In: Sennett R (ed.) *Classic Essays on the Culture of Cities*. New York: Appleton-Century-Croft.
151. Stapp, W. B., & Cox D. A. (1974). Environmental education model. In W. B. Stapp and D. A. Cox, (eds.) *Environmental education activities manual*. Michigan: Thomson-Shore, Dexter.
152. Strauss K. (2009). Cognition, context, and multimethod approaches to economic decision making. *Environment and Planning A* 41(2) 302-317.
153. Stuart A. Q. & Thomas L. F., (1939) The City. New York: Doubleday.
154. Swilling, M. (2013a). Beyond the Resource Curse: From Resource Wars to Sustainable Resource.
155. Tanzila, A. & Faisal, J. (2021). Investigating correlations between illness and defensive behaviour approach: A case of twin cities of Pakistan. *Heliyon*.7, Researcher Gate.
156. Thaler, R & Sunstein, C. (2003). Libertarian Paternalism. *The American Economic Review* 93: 175–79.
157. The Economis, (2010). *You choose.* 12th August, *397(8713) 123-125.*
158. Tönnies F (1955) *Community and Association*. London: Routledge.
159. Turok, I. (2015). Turning the Tide? the Emergency of National Urban Policies in Africa. *Journal of Contemporary African Studies*, 33(3):348-369. U.K.: Cambridge University Press.
160. Ubleble, B. A. & Gbenemene, K. A. (2017). Critique on Nigeria National Policy on Environment: Reasons for Policy Review. *IIARD International Journal of Geography and Environmental Management.* 3 (3) 22-36.
161. Uka, F. (2013). Ebonyi to partner US-based Firm on Waste Management. *Citizens Advocate*, November 7, 2013. Retrieved, 10th August 6, 2021

162. UN-HABITAT (2014). *State of African Cities 2014*. Nairobi: UN Habitat.
163. UN-HABITAT (2011). *Malawi: Blantyre Urban Profile*, Nairobi: UN-HABITAT Regional and Technical Cooperation Division.
164. UN-HABITAT (2012). *The State of Arab Cities 2012: Challenges of Urban Transition.* Nairobi: UN Habitat.
165. United Nations Development Programme. (2016). Promoting Sustainable Development Through More Effective Civil Society Participation in Environmental Governance: A Selection of Country Case Studies from the EU-NGOs Project. UNDP, New York.
166. United Nations Human Settlements Programme (UN-HABITAT) (2009). Planning Sustainable Cities. Nairobi: UN Habitat.
167. United Nations Human Settlements Programme (UN-Habitat) (2014). The State of African Cities Re-imagining sustainable urban transitions Nairobi: UN-Habitat.
168. United Nations Human Settlements Programme (UN-Habitat) (2014). *The State of African Cities* Nairobi: UN-Habitat.
169. VanDevender C. (2008). How self-restriction laws can influence societal norms and address problems of bounded rationality. *The Georgetown Law Journal* **96** 1775-1806.
170. Wagner, M., Merson, J., &Wentz, E. (2016). Design with Nature: Key lessons from McHarg's intrinsic suitability in the wake of Hurricane Sandy. *Landscape and Urban Planning,* 155, 33–46.
171. Wang C, Cardon PW, Liu J, Madni GR (2020). Social and economic factors responsible for environmental performance: A global analysis. *PLoS ONE* 15(8): e0237597. https://doi.org/10.1371/journal.pone.0237597.
172. Wang, X. ed. (2016). Ecological Wisdom for Urban Sustainability: Doing real and permanent good in ecological practice *Landscape and Urban Planning* 155 1–2.
173. Wang, X., Palazzo, D.,&Carper, M.(2016). Ecological wisdom as an emerging field of scholarly inquiry in urban planning and design. *Landscape and Urban Planning*, 155, 100–107.
174. Watson, V. (2009). The planned city sweeps the poor away: Urban planning and 21st century urbanization, *Progress in Planning*. 72:151–193.
175. Weber, M. 1965. (1922, 1947.) *The Theory of Social and Economic Organization.* NewYork: Free Press. Originally published as *Wirtsch. Ges.*, Part I.
176. Wekesa, Steyn, G.S. & Otieno, F.A.O. (2013). A Review of Physical and Socio-economic Characteristics and Intervention Approaches of Informal Settlements. *Habitat International*, 35(2), 238-245.
177. Wendling, Z. A., Emerson, J.W., de Sherbinin, A., Esty, D.C., *et al*. (2020). *2020 Environmental Performance Index*. New Haven, CT: Yale Center for Environmental Law & Policy. epi.yale.edu.
178. Wheatley P. (1971). *The Pivot of the Four Quarters: A Preliminary Enquiry into the Origins and Character of the Ancient Chinese City*. Chicago: Aldine
179. White, M. J. & Hunter L. (2009). Public perception of environmental issues in a developing setting: environmental concern in coastal Ghana. So*cial Science Quarterly*, 90: 960-982.
180. Wilkinson, T. M. (2013). Nudging and manipulation. *Political Studies* 61(2), 341–355.
181. Willis, L. (2013). When nudges fail: slippery defaults. *The University of Chicago Law Review* 80(3), 1155–1229.
182. Wolfersberger, J., Delacote, P., & Garcia, S. (2015). An empirical analysis of forest transition and land-use change in developing countries. *Ecological Economics*, 119, 241–251.
183. Wonah, E. I. (2017). The state, environmental policy and sustainable development in Nigeria. *Global Journal of Arts, Humanities and Social Sciences*. 5, (3), 25-40.
184. Wooltorton, S. (2006). *Ecological literacy ''basic'' for a sustainable future*. In Proceedings of the Social Educator's Association of Australia (SEEAA) national biennial conference. Brisbane, Australia
185. Xiang, W. (2016). Ecophronesis: The ecological practical wisdom for and from ecological practice. Landscape and Urban Planning, 155, 53–60.
186. Yagboyaju, D. A & Akinola A. O. (2019). Nigerian State and the Crisis of Governance: A Critical Exposition. *SAGE Open*. July 2019. doi:10.1177/2158244019865810
187. Yang, B. & Li,S.(2016).DesignwithNature:IanMcHarg'secologicalwisdomas actionable and practical knowledge. *Landscape and Urban Planning*, 155, 21–32.
188. Young, R. (2016). Modernity, postmodernity and ecological wisdom: Toward a new framework for landscape and urban planning. *Landscape and Urban Planning, 155, 19–99.*
189. Yusliza, M. Y., Amirudin, A., Rahadi, R. A., Nik, A. N., Athirah, S., Ramayah, T., Muhammad, Z., Dal Mas, F., Massaro, M., Saputra, J & Mokhlis, A. (2020). An Investigation of Pro-Environmental Behaviour and Sustainable Development in Malaysia. *Sustainability* 2020, 12, 7083; doi:10.3390/su12177083
190. Zhang, L. Yang, Z., Voinov, A. & Gao, S. (2016). Nature inspired storm water management practice: The ecological wisdom underlying the Tuanchen drainage system in Beijing, China and its contemporary relevance. *Landscape and Urban Planning, 155, 11–20*.
191. Zhao, J. (2019). Environmental Regulation: Lessons for Developing Economies in Asia. ADBI Working Paper 980. Tokyo: Asian Development Bank Institute. Available: https://www.adb.org/publications/environmental-regulation-lessons-developing- economiesasia.

192. Zoomers, A. Van Noorloos, F. Otsuki, K. Steel, G. & Van Westen, G. (2017). The Rush for Land in an Urbanizing World: From Land Grabbing Toward Developing Safe, Resilient, and Sustainable Cities and Landscapes. *World Development*. 92: 242–252.

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Miestų apgyvendinimas ir miestiečių elgsenos keitimasis aplinkosaugos politikos atžvilgiu pietryčių Nigerijoje: poveikis aplinkos politikos administravimui ir tvarumui

Anotacija

Aplinkos tarša ir gamtinės aplinkos tvarumas yra elgsenos mainų, vykstančių konkrečioje geografinėje aplinkoje ir laiko erdvėje, rezultatas, tačiau suderintas politikos ir administravimo metodais, kuriuos gali taikyti viešosios institucijos. Kiekviena elgsenos aplinka turi savo tikėtiną elgsenos nuostatą, kuri daugiau ar mažiau yra simbolinė toje aplinkoje gyvenančių žmonių tapatybė. Tačiau libertarinis paternalizmas, kaip politikos formavimo metodas ir politikos pasirinkimas, sukuria žmogaus teisių stebėjimo perspektyvą ir sistemos nulemtą elgsenos modifikavimą, siekiant maksimalaus bendradarbiavimo ir politikos tvarumo. Pietryčių Nigerijoje, šešiose šalies geopolitinėse zonose, aplinkos tarša per daugelį metų tapo daugelio miestų neatsiejama dalis. Nors kai kurie mokslininkai nagrinėjo šį klausimą kitais aspektais, dar nėra parengto tyrimų plano, skirto simbolinio elgesio keitimo esmei, siekiant suprasti miestiečių ir aplinkos politikos administravimo problemą, turinčią įtakos gamtinės aplinkos valdymui ir miestiečiams. Taikant libertarinio paternalizmo teorinį pagrindą ir apklausos tyrimo dizainą, šiame tyrime buvo atlikta nuosekli analizė, siekiant atskleisti miestiečių ir aplinkos valdymo politiką įgyvendinančių valdžios institucijų elgsenos mainus, susijusius su gamtine aplinka. Tai buvo pagrįsta pirminiais duomenimis, gautais naudojant kiekybinę duomenų rinkimo priemonę, kurioje dalyvavo 640 respondentų (vyresnių nei 18 metų) iš pietryčių Nigerijos miestų bendruomenių. Tyrime naudota aprašomoji statistika ir tiesinis modelis. Remiantis tyrimo rezultatais, matyti, kad miestiečių elgesys, susijęs su aplinkos tarša, yra plačiai paplitęs, o silpna politikos sistema ir jos įgyvendinimas sąlygojo slaptą prieš aplinkos apsaugą nukreiptą elgesį (R= 0,481, F= 38,097 ir P=,000). Įsipareigojimas saugoti aplinką priklausė nuo politinio sąmoningumo, visuomenės pasitikėjimo valdžios institucijomis, tvarkančiomis aplinką; informuotumo aplinkosaugos klausimais ir kt. (R= 0,906, F= 238,090 ir P= .000). Vyriausybės politika ir aplinkosaugos klausimus tvarkančių valdžios institucijų funkcionalumas turėjo įtakos pietryčių Nigerijos miestų gyventojų visuomenės žinioms apie gamtinę aplinką ir paramai valstybės vykdomai gamtinės aplinkos tvarkymo politikai (R= 0,818, F= 256,838 ir P= .000).

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