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Constraints to Effective Climate Change Adaptation Policies and Programmes in Osun State, Nigeria

Salami Afeez Alabi

Department of Geography and Environmental Management, University of Ilorin, Ilorin, Nigeria

Email address

Afeez_alabi@ymail.com

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Abstract: The study investigates the constraints to effective climate change adaptation policies and programmes in Osun State, Nigeria. Multistage random sampling technique was applied in the selection of respondents. Data were collected from 357 respondents through the use of interview schedule and structured questionnaire. Both mean scores and exploratory factor analysis procedure were used to analyze the data collected. The study discovered that different factors influence effective planning and implementation of climate change adaptation policy. The results showed that nine orthogonal factors were derived with a total explanation of 84.29% of the variance. Only variables with constraints loadings of 0.40 and above (10% overlapping variance; [5]) were used in naming the constraints. Institutional factor has the greatest impact on effective planning and implementation of climate change adaptation policy and programmes with 13.76% contribution while difficulty in enforcing laws on environmental management contributed the least variance of 6.90%. There is a need for an institutionalized monitoring mechanism across the State for purposes of environmental governance. There must be provision for adequate funding and other resources to promote high quality research that is critical for effective mitigation, adaptation and green development. This will go a long way in providing the appropriate climate change policies for the area and the country at large.

Keywords: Adaptation Policy, Climate Change, Constraints, Nigeria, Programmes, Strategies

1. Introduction

Climate change refers to the change in climate over time, whether due to natural variability or as a result of human activity and is widely recognized as the most serious environmental threat facing our planet today. It affects the atmospheric conditions of the earth thereby leading to global warming. Global warming is the average increase of the earth's surface temperature and oceans as compared to previous centuries. This is a result of the continuous trapping of heat within the earth's atmosphere due to increased quantity of greenhouse gases.

According to [14], climate change is, and will continue to be, a policy and planning concern for cities around the world. Even as action at the federal level stalls in many countries, cities are taking steps to reduce carbon emissions and adapt to the consequences of climate change. Climate Change remains one of the focal areas of the Federal Government of Nigeria for both its global importance, and most especially, its threats to the existence of Nigerians. The country is vulnerable to the impacts of climate change. Policy should be taken in adapting and mitigating its effects because Climate change has the potential to affect all natural systems thereby becoming a threat to human development and survival socially, politically and economically.

Global climate change is a significant challenge to structures of governance at all temporal and spatial scales, particularly in the area of managing natural resources. The importance of climate change and the need for action is now recognized, this is but one of several major areas for government policy. Climate change is a reality and more deadly than HIV as it can wipe out millions at a time.

Globally, cities are increasingly being affected by the vagaries of climate change. Many activities taking place in urban areas including the actions of individuals in cities generate a range of GHGs that contribute to climate change. Intergovernmental Panel on Climate Change (IPCC) is of the

view that forested-related mitigation activities are likely to be relatively low cost and can create important synergies with climate change adaption and sustainable development among others. Thus, green infrastructure offer further opportunities for mainstreaming climate change policy as they have potential to contribute to adaptation in many sectors [15].

There are several security challenges driven by climate change including, but not limited to, food shortages, water crises, catastrophic flooding, greater frequency and intensity of hydro-meteorological disasters, population displacement, and increased public health issues. [1] suggests that many municipal governments do not have adequate provisions in order to deal with increased climate hazards such as flood management. In well governed cities 'good provision for storm and surface drainage can easily be built into the urban fabric, along with complementary measures to protect flooding'. But in poorly governed cities this does not happen and it is common for buildings and infrastructure to be constructed that actually disrupt drainage channels' [7].

Urban governments have critical roles in adaptation to climate change in all nations as well as in mitigation (reducing greenhouse gas emissions). It can be argued that they have the central role in adaptation within their jurisdictions – although it is obvious that they need a supportive institutional, regulatory and financial framework from higher levels of government and, for most low- and middle-income nations, also from international agencies.

According to [10], timely and useful information is necessary about the possible consequences of climate change, people's perceptions of those consequences, available adaptation options, and the benefits of slowing the rate of climate change. Awareness and perceptions of a problem such as climate change shapes action or inaction on the problem [13]. Different successive governments have been playing their roles in adapting and mitigating the impact of climate change and vulnerability by providing and managing Green Infrastructure, urban built environment, controlling erosion among others.

The implication is that vulnerability of countries and societies to the effects of climate change depends not only on the magnitude of climatic stress but also on the sensitivity and capacity of affected societies to adapt to or cope with such stress [12]. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity [9].

There are challenges facing effective climate change policies and programmes in Nigeria. The study therefore investigates the constraints to effective climate change policies and programmes in Osun State, Nigeria.

2. The Study Area

Osogbo is situated between Latitude 7°43^{I} and 7°58^{I} north of the Equator and Longitude 4°31^{I} and 4°37^{I} east of the Greenwich Meridian (Figure 1). Osogbo and Olorunda Local Government Areas which constitute the study area occupies an area of about 144km^2 (55.6 sq. mi) with the total population of 288,455 [11]. The spatial extent of Osogbo that was 3.95 km^2 in 1962 had increased to 241.79 km^2 in 2011, indicating that city had been sprawling at an average rate of 4.9km^2 per annum between 1962 and 2011 [3].

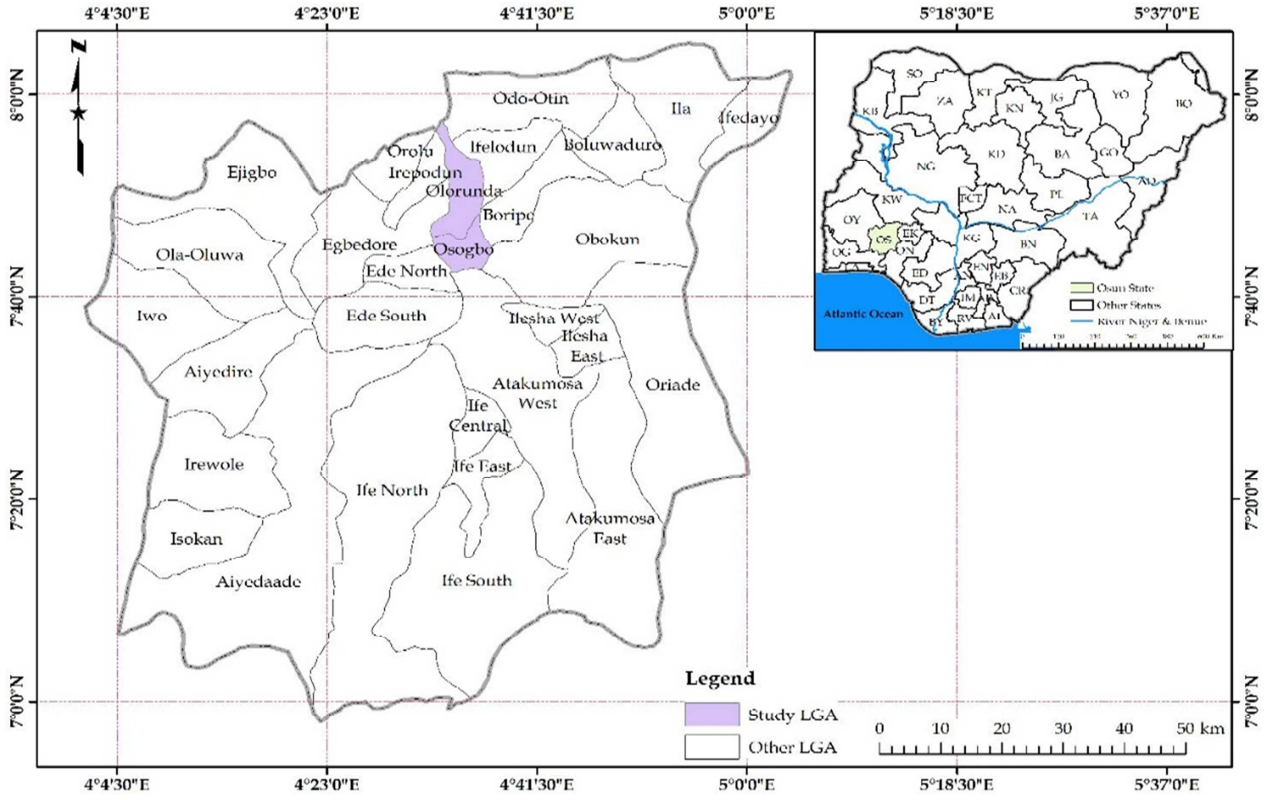

Figure 1. *Osun State Map Showing Osogbo with Nigeria as inset.*

Osogbo lies within a region of described as tropical climate (Aw) based on Koppen-Geiger climate classification. It has a tropical dry and wet climate. The wet season starts in April and ends in early October, while dry season starts in November and ends in March. The month of December and January are usually cold-dry months as a result of the influence of hamarttan from the desert region of the North. The highest rainfall usually occurs between June and July while the mean annual rainfall is about 1,241mm. The mean annual temperature is 26.1°C and the relative humidity for the area is between 92-99%. The driest month is January with 9mm of rainfall. Osogbo is a little bit clouded because of the thick vegetal cover. From 1975 to 2014, the mean annual values range from 5.2 to 7.2 oktas [14]. It is characterized by savanna vegetation. The topography is mainly gently undulating plains with undulating dissected plains. Osogbo is a major trading and distribution center for people within and outside its immediate environment. The emergence of Osogbo as a state capital coupled with other factors has led to the influx of people from other towns and villages, thus giving it the status of a twin city, that is, a traditional as well as a modern city [2, 6]. Most of the socio-economic activities as well as engineering constructions taking place in the city influence climate change through deforestation and emission of greenhouse gases.

3. Materials and Methods

Data used in this study were collected mainly from both primary and secondary sources. Detailed and well-structured questionnaire was designed and a total of 384 copies of questionnaires were administered using multistage random sampling technique while 357 copies were returned and analysed using both mean scores and exploratory factor analysis procedure. Factor analysis is a data reduction technique that is used to statistically aggregate a large number of observed measures (items) into a smaller set of unobserved (latent) variables called factors based on their underlying bivariate correlation patterns [4]. This technique is widely used for assessment of convergent and discriminant validity in multi-item measurement scales in social science research. Exploratory factor analysis procedure using the principal factor model with iteration and varimax rotation was further employed in grouping the constraint variables into major constraint factors. In factor analysis, the factor loading under each constraint (beta weight) represent a correlation of the variables (constraint areas) to the identified constraint factor and has the same interpretation as any correlation coefficient. However, only variables with loadings of 0.40 and above {(10% overlapping variance, [5]} will be used in naming the factors. Statistical Package for Social Sciences software called SPSS, version 20.0 was used for the analysis of the data obtained.

4. Results and Discussions

Data on Table 1 show that the major constraints to effective planning and implementation of climate change adaptation and mitigation policies/programmes include lack of adequate data (M = 3.65), poor funding (M = 3.83), inadequate research on climate change (M = 3.54), difficulty in mainstreaming climate change responses into infrastructure budgeting procedures (M = 3.32), lack of well-defined programmes (M = 3.06), problem of discontinuity on commitment to the policy (M = 3.26), political focus on short-term goals (M = 3.56), competition between climate change and other local priorities (M =4.10), lack of local government jurisdiction over areas such as building codes, transportation, or land use (M = 3.38), uncoordinated land use policy (M = 3.02) and lack of information about local Greenhouse Gas emissions (M = 3.17). Lack of adequate data makes the designing of climate change adaptation policies and programmes difficult and uncoordinated land use policy contributes to environmental degradation. It is therefore imperative that any meaningful environmental policy to be effective, it has to be accompanied by an effective public awareness about the knowledge of the environment and changes or fluctuations associated with the environment.

Other major constraints to the implementation policies on climate change include difficulty mainstreaming climate change policies and programmes into existing departmental functions (M =3.66), absence of innovative approaches to mitigating climate change such as carbon sequestration, smart city concept, garden city concept, etc. (M = 3.20), lack of citizen participation (M = 3.68), difficulty in implementing policies that require collaboration between siloized local government agencies (M = 3.59), lack of access to necessary technology for climate change planning and implementation (M = 3.83), difficulty in enforcing laws on environmental management (M =4.03) and the general ignorance of the issues of climate change by the urban populace (M =3.53).

Despite the fact that the world is talking about measures of adapting and mitigating the dangerous consequences of changes brought about by the altering climate, findings from this research revealed that the government and residents of Osogbo, Osun State, Nigeria are being constrained to adaptation by factors stated above. These further points to the need for external supports to climate change issue and efficient urban governance in building climate resilient as well as to have an enduring system of information dissemination in the State.

Table 1. *Mean Distribution of Constraints to Effective Planning and Implementation of Climate Change Adaptation and Mitigation Strategies.*

Constraint Variables *	Mean	SD
Lack of adequate data	3.65*	1.196
Poor funding for implementation	3.83*	1.135
Inadequate research on climate change	3.54*	1.077
Difficulty mainstreaming climate change responses into infrastructure budgeting procedures	3.32*	1.235
Lack of well-defined programmes	3.06*	0.905
Problem of discontinuity on commitment to the policy	3.26*	1.224
Political focus on short-term goals	3.56*	0.957
Competition between climate change and other local priorities (in areas such as health, nutrition, housing, sanitation, and economic growth)	4.10*	1.253
Lack of local government jurisdiction over areas such as building codes, transportation, or land use	3.38*	1.063
Shortage of staff or staff time to work on climate change	2.65	1.260
Lack of understanding of Local Government responses	2.99	1.268
Absence of water management techniques	2.54	1.064
Uncoordinated land use policy	3.02*	1.073
Lack of information about local Greenhouse Gas emissions	3.17*	1.375
Difficulty mainstreaming climate change policies and programmes into existing departmental functions	3.66*	0.874
Absence of innovative approaches to mitigating climate change such as carbon sequestration, smart city concept, garden city concept, etc.	3.20*	0.981
Lack of citizen participation	3.68*	1.136
Difficulty implementing policies that require collaboration between siloized local government agencies	3.59*	0.966
Lack of access to necessary technology for climate change planning and implementation	3.83*	0.960
Difficulty in enforcing laws on environmental management	4.03*	0.793
General ignorance of the issues of climate change by the urban populace	3.53*	0.993
Ineffectiveness of indigenous strategies	2.81	0.966
Absence of a National Climate Change Policy or Strategy	2.38	1.027

* Significant S.D. = Standard Deviation
Source: Author's Field Survey, 2016

The data were further subjected to exploratory factor analysis in order to group the constraints variables. The result of the rotated component matrix showing the extracted factors based on the response of respondents is shown in Table 2 below. The results show that nine orthogonal factors were derived with a total explanation of 84.29% of the variance. Only variables with constraints loadings of 0.40 and above (10% overlapping variance; [5]) were used in naming the constraints. The Eigen values, percentage of variance and cumulative percentage of the variance explained are also presented in Table 2.

Factor one (1) is tagged institutional factor. It has the greatest impact on effective planning and implementation of climate change adaptation policy and programmes with 13.76% contribution. The factor loads highly on the lack of information about local Greenhouse Gas emissions and uncoordinated land use policy. Uncoordinated land use policy contributes to environmental degradation. The strength of the available institutions in the study area is weak; hence the absence of enduring government policies on climate changes in the State and the country as a whole.

The second factor is designated as awareness factor. It is highly loaded on the three constraints variables namely absence of water management techniques, lack of information or low awareness level on local impacts of climate change and lack of understanding of local government responses. A lack of information on adaptation measures could lead to inabilities to adapt and mitigate the effects of climate change. This could be true because information empowers an individual to seek for solution in appropriate quarters. This suggests the contribution of these variables as the only constraints to effective implementation of climate change policies and programmes. It contributes 10.72% of the variance.

Factor three (3) is the government failures; it contributes 10.64% explanation and this factor is highly loaded on only three variables: it is negatively loaded on of % problem of discontinuity on commitment to the policy and % lack of well-defined programmes, while it has a positive loading on % general ignorance of the issues of climate change by the urban populace. Lack of well-defined programmes is an important problem because a lot of programmes and activities aimed at achieving the objectives are not well designed and organized. For instance, tree planting campaigns are not properly coordinated in the State.

Factor four (4) is designated as policy factor. It is positively and highly loaded on the only one variable; which is difficulty in mainstreaming climate change policies and programmes into existing departmental functions. The factor offers 9.86% explanation of variance.

Factor five (5) is regarded as the individual factor and it loaded highly on two variables. It both has positive loading on percentage of the citizen participation and percentage of the climate change research. The factor offers 9.77% explanation of variance.

Factor six (6) is named as implementation factor: it contributes 7.84% explanation and this factor is positively and highly loaded on the difficulty in implementing policies that require collaboration between siloized local government agencies.

Factor seven (7) is tagged as financial factor. It has a profound impact on the effective implementation of climate

change adaptation policy and programmes with 7.57% contribution. The factor loads highly on the Poor funding for implementation. [8] opined that the chief constraints to climate change planning and implementation are financial and technological constraints. Money is needed in almost every aspect of environmental quality/sustainability and when this is not available, it becomes a problem for the governments. It has been observed that some government officials put personal interest before public interest in planning and implementing policies and programmes on climate change for the purpose of achieving environmental sustainability.

Factor eight (8) is regarded as national policy or strategy factor. It contributes 7.23% explanation and this factor is highly loaded on only one variable: it is positively loaded on of % absence of a National Climate Change Policy or Strategy.

Finally, difficulty in enforcing laws on environmental management constitutes the last constraint factor. Its factor loaded is positively high and has the least impact on adaptation and mitigation of climate change implementation policy with 6.90% contribution.

Table 2. *Factor Loadings, Eigenvalues and Percent and Cumulative Variance of Climate Change Constraints.*

	Constraints Variables	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**	**Factor 6**	**Factor 7**	**Factor 8**	**Factor 9**
1.	Lack of information about local Greenhouse Gas emissions	0.915	-0.017	0.102	0.086	0.051	0.064	-0.110	-0.022	-0.077
2.	Uncoordinated land use policy	0.741	0.228	0.040	-0.100	-0.049	0.032	0.352	-0.280	0.218
3.	Ineffectiveness of indigenous strategies	0.616	0.154	0.487	-0.009	0.155	-0.163	0.078	0.213	-0.147
4.	Absence of innovative approaches to mitigating climate change such as carbon sequestration, smart city concept, garden city concept, etc.	0.559	-0.022	0.342	0.286	0.004	0.359	0.114	0.195	0.424
5.	Absence of water management techniques	0.094	0.827	0.133	0.000	0.220	0.059	0.118	-0.031	0.107
6.	Lack of information or low awareness level on local impacts of climate change	-0.005	0.681	-0.104	0.230	-0.081	0.069	-0.385	0.070	0.191
7.	Lack of understanding of Local Government responses	0.338	0.583	0.136	-0.320	-0.201	0.316	0.235	0.055	-0.113
8.	Lack of adequate data	0.557	0.564	-0.286	-0.300	-0.110	-0.069	0.248	0.187	-0.033
9.	Problem of discontinuity on commitment to the policy	-0.017	0.008	-0.871	0.074	0.038	0.064	0.159	0.179	-0.196
10	General ignorance of the issues of climate change by the urban populace	0.115	-0.156	0.709	0.226	0.053	0.008	0.324	-0.081	0.293
11	Lack of well-defined programmes	-0.045	-0.338	-0.577	-0.150	-0.193	-0.260	0.025	0.380	0.357
12	Shortage of staff or staff time to work on climate change	0.364	0.400	0.568	-0.144	-0.046	-0.138	-0.036	0.367	-0.037
13	Difficulty mainstreaming climate change policies and programmes into existing departmental functions	0.129	0.028	0.101	0.916	-0.066	0.105	0.121	0.084	-0.032
14	Competition between climate change and other local priorities (in areas such as health, nutrition, housing, sanitation, and economic growth)	-0.217	0.023	-0.097	0.688	0.468	-0.100	-0.124	0.027	0.093
15	Lack of citizen participation	0.131	-0.039	0.105	0.078	0.959	0.009	-0.007	0.016	0.079
16	Lack of access to necessary technology for climate change planning and implementation	0.100	-0.006	-0.107	-0.021	0.661	0.109	0.431	0.111	-0.411
17	Inadequate research on climate change	-0.314	0.372	0.009	0.062	0.581	0.304	0.270	0.124	0.135
18	Difficulty implementing policies that require collaboration between siloized local government agencies	0.036	0.129	-0.017	0.165	0.107	0.869	0.094	0.155	-0.187
19	Political focus on short-term goals	0.528	0.231	-0.129	-0.357	0.154	0.566	0.090	0.001	0.052
20	Lack of local government jurisdiction over areas such as building codes, transportation, or land use	0.363	0.244	0.132	0.412	0.425	-0.502	-0.050	-0.079	-0.255
21	Poor funding for implementation	0.096	0.056	0.002	0.092	0.127	0.119	0.931	0.040	0.007
22	Absence of a National Climate Change Policy or Strategy	0.043	0.167	-0.148	0.032	0.075	0.167	-0.048	0.858	-0.146
23	Difficulty mainstreaming climate change responses into infrastructure budgeting procedures	-0.173	-0.214	-0.035	0.514	0.098	0.096	0.275	0.622	0.030
24	Difficulty in enforcing laws on environmental management	0.008	0.208	0.205	-0.003	0.036	-0.119	-0.014	-0.146	0.871
	Total Eigenvalues	*3.301*	*2.573*	*2.552*	*2.366*	*2.345*	*1.882*	*1.818*	*1.736*	*1.656*
	% of Variance Explained	*13.756*	*10.722*	*10.635*	*9.856*	*9.773*	*7.840*	*7.574*	*7.232*	*6.901*
	Cumulative % of Variance Explained	*13.756*	*24.478*	*35.113*	*44.970*	*54.743*	*62.583*	*70.157*	*77.389*	*84.290*

Source: SPSS-generated

5. Conclusion and Recommendations

The study investigates the constraints and strategies towards effective implementation of climate change adaptation policies and programmes in Osun State. The factor analysis technique employed reduced the 24 constraints variables to nine orthogonal factors in the case of constraints to climate change planning and implementation policy in the study area. The study discovered that different factors influence effective planning and implementation of climate change adaptation policy. As indicated in Table 2, institutional factor has the greatest impact on effective planning and implementation of climate change adaptation policy and programmes with 13.76% contribution while difficulty in enforcing laws on environmental management contributed the least variance of 6.90%. Solutions should be provided to the constraints to climate change adaptation policy and programmes. There is a need for an institutionalized monitoring mechanism across the State for purposes of environmental governance; The Federal and State Governments should adapt global best practice and domesticate relevant international laws for effective environmental governance. There must be provision for adequate funding and other resources to promote high quality research that is critical for effective mitigation, adaptation and green development. This will go a long way in providing the appropriate climate change policies for the area and the country at large.

References

[1] Action Aid (2006). Unjust waters: Climate change, flooding and the protection of poor urban communities – Experiences from six African cities. 3-10.

[2] Adenaike, F. (1991). The pioneers. Ministry of Information, Osun State of Nigeria.

[3] Aguda, A. S. and Adegboyega, S. A. (2013). Evaluation of spatio-temporal dynamics of urban sprawl in Osogbo, Nigeria using Satellite Imagery and GIS Techniques. International Journal of Multidisciplinary and Current Research, 60-73. Retrieved, March 23, 2015, from http://ijmcr.com

[4] Anol, B. (2012). Social science research: Principles, methods, and practices (2nd Edition). University of South Florida Tampa, Florida, USA. Published under the Creative Commons Attribution-Non Commercial-Share Alike 3.0 Unported License. 135-136. Retrieved 9th February, 2015 from http://scholarcommons.usf.edu/cgi/viewcontent.cgi?article=1002&context=oa_textbooks

[5] Comrey, A. L. (1962). The minimum residual method of factor analysis. Psychological Reports, 11, 15–18.

[6] Egunjobi, L. (1995). Aspects of urbanization, physical planning and development Oshogbo. In: Adepegba, C. O. (Ed.), Model of growing African town. Institute of African Studies, University of Ibadan, Nigeria, 13–28.

[7] Huq, S., Kovats, S., Reid, H. and Satterthwaite, D. (2007a). Reducing risks to cities from disasters and climate change. Environment and Urbanization, 19 (1), 39-64.

[8] Intergovernmental Panel on Climate Change (IPCC), (2007). Climate change 2007: Impacts, adaptation and vulnerability. Working group ii contribution to the IPCC fourth assessment report. Cambridge University Press.

[9] IPCC, (2001). Climate change 2001: Impacts, adaptation and vulnerability: Contribution of working group ii to the third assessment report of the Intergovernmental Panel on Climate Change (IPCC). Cambridge.

[10] Olorunfemi, J. F. (2009). Risk communication in climate change and adaptation: Policy issues and challenges for Nigeria. Earth and Environmental Science, 6. University Press, Cambridge UK and New York. doi: 10.1088/1755-1307/6/1/412036.

[11] National Population Commission (NPC), (2006). 2006 Population and housing census of the Federal Republic of Nigeria: Priority tables. Volume 1. Abuja: National Population Commission.

[12] Nigerian Environmental Study/Action Team (NEST) (2004). Regional climate modeling and climate scenarios development in support of vulnerability and adaptations studies: Outcome of regional climate modeling efforts over Nigeria. Ibadan: NEST.

[13] Nzeadibe, T. C. and Ajaero, C. K. (2010). Informal waste recycling and urban governance in Nigeria: Some experiences and policy implications. Handbook of Environmental Policy, 245-264.

[14] Salami, A. A. (2016). Urban governance and climate change in Osogbo, Osun State, Nigeria. An unpublished M.Sc. thesis submitted to the department of Geography and Environmental Management, University of Ilorin, Ilorin, Nigeria.

[15] Wilson, E. B. and Piper, J. (2010). Spatial planning and climate Change. Abingdon and New York: Routledge.