

Environmental Technology & Science Journal

Vol. 8 No. 1

June 2017

Aim and Scope

The Environmental Technology and Science Journal (ETSJ) is devoted to the publication of papers which advance knowledge of practical and theoretical issues of the environmental technology. The aim of the journal is to provide an avenue for dissemination of academic research findings from various disciplines of the environment, engineering, pure and applied sciences, arts and social science, which have materials that emphasize on environmental issues.

ETSJ Policy

ETSJ prohibits an author from submitting the same manuscript for concurrent consideration by two or more publications. The author must ensure that when a manuscript is submitted to ETSJ, the manuscript must be an original work. The Author should check the manuscript for any possible plagiarism using any program such as TURNITIN or any other software before submitting the manuscripts to ETSJ. Authors are not permitted to add or remove any names from the authorship provided at the time of initial submission without the consent of the Journal's Editor-in-Chief.

Guide for Authors

Please read the guidelines and follow the instructions carefully; doing so will ensure that the publication of your manuscript is as rapid and efficient as possible. The Editorial Board reserves the right to return manuscripts without review that are not prepared in accordance with these guidelines.

1. Manuscripts should not be more than 15 pages of A4 paper size (including abstracts, tables, figures, references and appendices) typed in double spacing, times new roman and font size 12.
2. Each paper must be compiled in one column; all text should be left and right justified. The page settings to be 25cm (1 inch) each for the top, bottom, left and right margins of an A4 paper. Decimal numbering of all sections of the article is recommended (with the exception of the reference and acknowledgement sections).
3. To ensure anonymity in the peer reviewing process, articles must be structured in such a way that the title of the paper, authors' names, address, and affiliation are written on the first page, followed by abstract and the body of the paper in that order.
4. Each article should contain an abstract of not more than 300 words.
5. Each article should contain between 5 and 7 key words (avoid use of phrases).
6. Use the SI (*Systeme Internationale*) units and symbols, while Unusual Characters and symbols should be explained in a list of nomenclatures.
7. The journal's referencing style is the APA format.
8. Figures, Tables and Graphs are to be placed at the appropriate places in the paper and not at the end of the paper.

9. Acknowledgement is optional, except for researches being funded through research grant awards.
10. Authors should avoid using headers, footers and special page breaks within the manuscripts.
11. The manuscript is to be sent via electronic means to: **estj@futminna.edu.ng** for a blind peer review, which under normal circumstance will not exceed 4 weeks, after which the status of the article will be communicated to the Author(s).
12. Author(s) with positive review will be asked to effect corrections or revisions after which the camera-ready manuscript is to be emailed to estj@futminna.edu.ng and to be accompanied by evidence of payment of publication fee.
13. The Editorial board is not responsible for the information or views expressed by the author(s).

Frequency of Publication

The journal is published twice a year in June and December

Subscription Details

The 2017 subscription rates for hardcopies of the journals including postage are:

Individual within Nigeria: N2,000 per copy and N1,000 for postage

Individual outside Nigeria including postage \$ 100

Institution within Nigeria: N5,000 per copy and N1,000 for postage

Institution outside Nigeria including postage: \$ 150

Correspondence

All correspondence should be addressed to

The Managing Editor

Environmental Technology & Science Journal

SET, FUT, Minna, Nigeria

Email: estj@futminna.edu.ng

Phone: 08051703663, 08036534507

Published By

School of Environmental Technology, Federal University of Technology,
Minna, Nigeria.

Editor- In- Chief

Prof. O. O. Morenikeji

Department of Urban & Regional
Planning,
Federal University of Technology,
Minna, Nigeria

Deputy Editor-In-Chief/Managing Editor

Dr R. A. Jimoh

Department of Building,
Federal University of Technology,
Minna, Nigeria

Editorial Assistant

Dr I. B. Muhammad

Department of Architecture,
Federal University of Technology,
Minna, Nigeria

Editorial Committee

Dr O. F. Adedayo

Department of Architecture,
Federal University of Technology,
Minna, Nigeria

Dr A. D. Adamu

Department of Quantity Surveying,
Federal University of Technology,
Minna, Nigeria

Dr I. C. Onuigbo

Department of Surveying &
Geoinformatics,
Federal University of Technology,
Minna, Nigeria

Dr O. A. Kemiki

Department of Estate Management and
Valuation,
Federal University of Technology,
Minna, Nigeria

Dr P. Ayuba

Department of Architecture,
Federal University of Technology,
Minna, Nigeria

Dr J. E. Idiake

Department of Quantity Surveying,
Federal University of Technology,
Minna, Nigeria

Dr A. Kawu

Department of Urban & Regional
Planning,
Federal University of Technology,
Minna, Nigeria

Editorial Advisers

Prof. A. M. Junaid

Department of Urban & Regional
Planning,
Federal University of Technology,
Minna, Nigeria

Prof. Y. A. Sanusi

Department of Urban & Regional
Planning,
Federal University of Technology,
Minna, Nigeria

Prof. D. A. Muazu

Department of Building,
Federal University of Technology,
Minna, Nigeria

Prof. (Mrs) S. N. Zubairu

Department of Architecture,
Federal University of Technology,
Minna, Nigeria

Prof. I. O. Aje

Department of Quantity Surveying,
Federal University of Technology,
Akure, Nigeria

Prof. B. T. Aluko

Dept. of Estate Management,
Obafemi Awolowo University,
Ile-Ife, Nigeria

Prof. P. C. Nwilo

Department of Surveying &
Geoinformatics,
University of Lagos,
Lagos, Nigeria

Prof. U. O. Nkwogu

Department of Architecture,
Imo State University,
Owerri, Nigeria

Editorial

It is my honour as the Managing Editor on behalf of the Editorial Board to present volume 8, number 1, June 2017 edition of the Environmental Technology and Science Journal (ETSJ) to the research community with a view to expanding the discourse and provide a platform for robust academic debate. As the world's population continues to expand, implementation of resource-efficient measures in all areas of human activities is imperative. The built environment is one clear example of the impact of human activity on resources. To this end, this edition presented fifteen well-researched articles ranging from construction materials, climate change issues, car park management to real estate issues, waste management, health and safety matters and transportation.

Concrete deteriorates considerably when exposed to aggressive chemicals such as acids. Incorporation of pozzolana to concrete can ameliorate its effectiveness in these chemicals but this has to be experimentally established. Therefore, Aka *et al.* investigated the effect of pozzolana; (rice husk ash (RHA), powdered burnt brick (PBB) and saw dust ash (SDA) on the compressive strength of concrete in chemically aggressive environment. The results showed that RHA and PBB concrete exhibited better strength than SDA and the control specimen in $MgSO_4$ solution. The study concluded that RHA and PBB concrete are highly resistant to $MgSO_4$ and can be recommended as sulphate resistant additive in concrete production.

Climate change represents a significant environmental, social and economic threat and is now firmly recognized by the majority of the world's governments and scientists as an issue of extreme concern for the planet. The public perception of climate

change on both local and global scales by residents of Minna, Niger State was interrogated by Odegbenro and Ojoye in the second paper. The findings revealed that 85.6% of the public were aware of the change in climate using change rainfall and temperature pattern as indicators. The respondents noticed that there are changes in the amount of rainfall received and increase in average daily temperature while 14.4% were completely unaware of climate change issues. The study thereby recommended among others that information and communication technology be used to sensitize people on the effects of changing climate.

Olufemi *et al.* in the third paper assessed shoreline changes, land use and land cover change, geomorphological changes of the coast. The shoreline change movement showed that between 1980 and 1990, the net shoreline movement was estimated 259 meters while the net shoreline movement between 1980 and 2010 was about 347 meters. The end-point rate also indicated the rates of erosion (424.96 meters) and accretion (277.5 meters) (loss and gain), suggesting higher increase in erosion over accretion. The study advocated continuous monitoring of shoreline changes to reinforce our understanding and establishing the processes driving erosion and accretion in the coastal areas.

Creating an outdoor learning and play environment is an initiative that would incorporate green design principles targeted at meeting children's developmental needs. Children developmental needs are cognitive, physical, social and emotional. The forth paper by Ayuba and Akpama assessed the physical outdoor spaces and natural elements in elementary schools with

a view to integrating these elements in elementary schools in Minna. The findings revealed that only 25% of the playgrounds of elementary schools in Minna have above average fixed components. The paper recommended that play-learning environment be integrated in elementary schools in Minna.

Parking management is increasingly becoming a major component of surface transport planning needs of public institutions like schools and hospitals, this is because the means of transportation cannot continually be in motion. Zaria metropolis harbors a number of such institutions which generates substantial vehicular traffic. Despite efforts by these institutions to provide parking facilities in the past ten years, persistent incidences of indiscriminate parking, non-usage of prescribed parking lots, double and road side parking is still very common. To this end, Oluwole *et al.* examined car par usage and management in five Federal Institutions (NITT, ABUTH, NCAT, FCE and NARICT) within Zaria Metropolis in the fifth paper. According to the authors, the major challenges faced by users of the car park facilities are long distance of the parking lots to the destination of the users within the institutions as well as poor medium of communication and direction to the available parking facilities. The implication of this study to the usage and management of car park in the study area lies in the provision of additional designated parking facilities to accommodate the increasing number of vehicles, strict enforcement through monitoring.

The sixth paper by Babatunde examined the dependability of Two-Third of Market Value (TTMV) model of determining liquidation value of real estate collateral in Niger State. The results showed that only

one ESV firm identified Market Survey Model (MSM) as the appropriate model of liquidation valuation (LV); that liquidation values assessed by the ESV firms ranged between 60% and 88.20% of market value (MV) in the state. The paper recommended MSM to the valuation regulators as the basis of LV assessment where the property market is active in the state.

As cities develop and grow, urban renewal is often carried out which requires that existing structures be made to reflect changes in modern architecture and to meet new standards. This process is often done hurriedly and without necessary precautionary measures required to salvage building components that may still be valuable and reusable. Selected urban renewal and renovation sites were examined by Ayuba and Albert in the seventh paper in order to find out the techniques employed in removing whole or parts of such existing structures for effective reuse or recycling. The findings demonstrated a lack of technical know-how as well as deployment of unsuitable equipment during the construction process. The authors recommended that greater partnership between construction industry and recycling factories should be encouraged.

The shorelines are highly dynamic and ever changing. Many factors influence these changes including the type of shoreline (rocky, sandy), wave activity, tidal variations, storms and human impacts. The shoreline change study is necessary for updating the shoreline change maps and management of natural resources. Based on this, the eighth paper by Adebola *et al.* examined the shoreline changes of Akwa Ibom State for three different years 1990, 2000 and 2016; changes that occur in the land use land cover of the area and landforms around the coast. The study

concluded that the shoreline is eroding at -19.03 m/yr and accreting at 15 m/yr. Hence, the study will be very helpful for local administrative bodies for decision making in the state and coastal management in the country.

Abd'razack *et al.* assessed the risk of residing in proximity to illegal waste dump sites in Sabon Wuse, North-Central, Nigeria in the ninth paper. The level of health risk associated with living close to dumpsites showed that a total of 878 houses are at the severe risk, while, 1,898 houses are at mild risk level. The study advocated that there should be a total clearance of the existing illegal dump site and proper monitoring of the waste management in the town to forestall illegal dumping, and adequate information to residents and awareness on the danger of consequences of indiscriminate dumping of refuse in undesignated dump sites.

In the tenth paper, the application of mass appraisal model in Nigeria was examined by Liman *et al.* The regression results revealed the contributory effect of the different housing attributes on the house price. Based on these results, a mass appraisal model for residential property valuation was developed. The study discovered that a good mass appraisal model can bring about improvement in property tax administration in the study area by reducing cost and ensuring fairness and equity, which are very crucial in any property tax assessment process.

The Urban Heat Island effect is linked to the built environment and threatens human health during extreme heat events. Duchi and Musa examined the spatial pattern of heat islands in Zaria urban area in the eleventh paper. The results showed the correlation between the maximum

temperature and the years of analysis as 0.8433 with 84.33% linear relationship. The coefficient of determination R^2 is 0.7112 which reveals 71.12% change in maximum temperature caused by variation of time. The authors recommended the creation of shelter belt and stabilizing river embankment among other remedial measures.

Yakubu in the twelfth paper assessed safety and health performance of contractor's construction project in Nigeria using Safety and Health Assessment System in Construction (SHASSIC) method. The result of the assessment showed that the performance of the contractors was two (2) stars in ranking. Therefore, what the industry needs according to the author was an act that provides for the promotion, coordination, administration and enforcement of occupational safety and health.

The thirteenth paper by Olatunji established that an assessment index to guide Estate Surveyors and Valuers (ESV), willing to offer housing procurement service for house-seekers does not exist. The paper therefore sought to develop an Optimality Index, (OPTi), a simulation framework to assess Housing Choice Optimality (HcO), and test its application from two perspectives based on utility optimization of 5 key variables. The study revealed that indeed there were variations in HcO across households in the 6 neighbourhoods studied. The consistency of the results according to the author with well-known pattern in Abuja housing market is a proof that the simulation package could assess housing wellbeing objectively.

The effects of road quality on commercial land use pattern in Makurdi Urban, Benue State by Umoren and Mchi in the fourteenth

paper indicated that interaction effects between neighbourhood and road quality was not statistically significant. The paper recommended that mix use development be encouraged and more roads to link the neighbourhoods in Makurdi urban should be developed.

Resident's wellbeing is a key factor in the quest to provide residence and neighbourhoods that are people-responsively designed, produced and situated in a conducive physical environment to bring about satisfaction, quality of life and health. The focus of the fifteenth by Johnson *et al.* attempted to find out how the physical attributes of residential units and the immediate neighbourhood impact on the wellbeing of residents. The results indicated that the neighbourhood amenities beneficial to resident's wellbeing

proposed at design stage were either grossly inadequate and now completely absent. The authors recommended that firmer proactive development control policy actions and best professional practices are necessary to protect occupants, maintain current residential capacity and hence make the residential developments sustainable in terms of well-being.

It is my hope that the issues interrogated in this edition will spur us towards making our environment a better place. Happy reading!

R. A. Jimoh, PhD
Managing Editor

Contents

- 1-11 Effect of Pozzolana on the Compressive Strength of Concrete in Chemically Aggressive Environment
Aka, A., Musa, A. A., Kaase, E.T. & Tukur, A.
- 12-19 Assessment of Public Perception of Climate Change Issues in Minna, Niger State, Nigeria
Odegbenro, F.J. & Ojoye, S.
- 20-31 Geospatial Analysis of Shoreline Dynamics in the Coastal Areas of Cross River State Nigeria
Adebola, A. O., Adegboyega, S. A. & Ibitoye, M. O.
- 32-41 Evaluation of Key Design Elements for Play-Learning Environment in Elementary Schools in Minna, Nigeria
Ayuba, P. & Akpama, D. S.
- 42-53 Car Park Usage and Management in Federal Institutions of Zaria Metropolis, Kaduna State- Nigeria
Oluwole, M. S., Masugari, D. Y. and Elegonye, I. I.
- 54-65 Reliability of the Liquidation Valuation Models of Selected Real Estate Collaterals in Niger State
Babatunde, I. O.
- 66-75 Appraisal of Recycling of Deconstructed Building Materials from Selected Renewal and Renovation Projects in Minna
Ayuba, P. & Albert, B. S.
- 76-89 A Geospatial Analysis of Coastal Land use/Land Cover Pattern and Shoreline Changes in Akwa-Ibom State, Nigeria
Adebola, A. O., Ojoye, S. & Ibitoye, M. O.
- 90-106 The Risk of Residing in Proximity to Illegal Waste Dump Site in Sabon Wuse, North-Central, Nigeria
Abd'razack, N. T.A., Medayese, S.O., Umaru, E.T. & Shaibu, S.I.

- 107-116 Developing a Mass Appraisal Approach for Residential Properties in Minna Metropolis
Liman, H. S., Olatunji, I. A., Morenikeji, G., Olubajo, O. O. & Usman Z. D.
- 117-129 Assessment of Urban Heat Island in Zaria Urban Area
Fidelis, C. D. & Musa, W. K.
- 130-138 Assessment of Safety and Health Performance of Contractors' Construction Projects in Nigeria Using SHASSIC Method
Yakubu. D. M.
- 139-150 A Simulation Framework for Housing Choice Optimality: Decision-Support Guide for Housing Procurement Service in Abuja
Olatunji, I.A.
- 151-160 The Effects of Road Quality on Commercial Land Use Pattern in Makurdi Urban, Benue State, Nigeria
Umoren, V. & Mchi, A.
- 161-177 Assessment of Residential Attributes of Lagos State Development and Property Corporation's Residential Schemes on Resident's Well-Being
Johnson, M. B., Adebamowo, M. & Adejumo, O.