FEDERAL UNIVERSITY OF TECHNOLOGY MINNA

SCHOOL OF ENVIRONMENTAL TECHNOLOGY INTERNATIONAL CONFERENCE (SETIC 2016)

BOOK OF *Abstracts*

EDITORS:

Yekeen A. SANUSI

Olatunde F. ADEDAYO

Richard A. JIMOH

Luqman O. OYEWOBI

THEME:

SUSTAINABLE BUILT ENVIRONMENT AND CLIMATE CHANGE: THE CHALLENGE OF POST 2015 DEVELOPMENT AGENDA

DATE:	VENUE:	TIME:
TUE. 10TH - THUR. 12TH MAY, 2016	SCHOOL OF ENVIRONMENTAL TECHNOLOGY COMPLEX	9:00AM - 5:00PM DAILY

CHIEF HOST:
PROF M. A. AKANJI
VICE CHANCELLOR, FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

HOST:
PROF Y. A. SANUSI
DEAN, SCHOOL OF ENVIRONMENTAL TECHNOLOGY, FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

SUPPORTED BY

School of Environmental Technology International Conference (SETIC) 2016

10-12 May 2016

Federal University of Technology Minna, Niger State, Nigeria

Book of Abstracts

Editors

Yekeen A. SANUSI,
Olatunde F. ADEDAYO,
Richard A. JIMOH,
Luqman O. OYEWOBI,

Book of Abstracts of the School of Environmental Technology International Conference (SETIC) 2016

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10th – 12th May 2016
School of Environmental Technology,
Federal University of Technology, Minna, Niger State, Nigeria.

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FOREWORD

The organising committee of the 1st School of Environmental Technology International Conference is pleased to welcome you to Federal University of Technology Minna, Niger State Nigeria.

The conference provides an international forum for researchers and professionals in the built and allied professions to address fundamental problems, challenges and prospects that affect the Built Environment as it relates to Climate Change and Sustainable Development. The conference is a platform where recognised best practices, theories and concepts are shared and discussed amongst academics, practitioners and researchers. The papers and scope are quite broad but have been organised around the sub-themes listed below:

- Infrastructure Development and Financing
- Sustainable Practice Theories
- Urban Resilience and Energy Conservation
- Waste Management and Sanitation
- Health and Safety Issues
- Climate Change and Threat to Sustainability of the Built Environment
- Climate Change Induced Disaster
- Designing the Human Settlement for Climate Change
- Conceptual Issues on Climate Change and Sustainable Development
- Sustainable Materials
- Cross Cutting Issues

The peer review process saw us making use of 48 senior academics and specialist as reviewers drawn from institutions in Nigeria and England. There were some papers were outside the theme of the conference but we had to create a cross cutting issues to accommodate such papers this is in spirit that every knowledge is important.

We hope you enjoy your time at our conference, and that you have the opportunities to exchange ideas and share knowledge, as well as participate in productive discussions with the like-minded researchers and practitioners in the built environment and academia.

Professor Yekeen Adeeyo Sanusi
Conference Chair
School of Environmental Technology International (SETIC) 2016
Federal University of Technology Minna, Niger State Nigeria.
May 2016

ACKNOWLEDGEMENTS

The success of the 1st School of Environmental Technology International Conference holding at the Main Campus of the Federal University of Technology Minna, Nigeria is predicated on the support and goodwill from Vice-Chancellor of Federal University of Technology and many other highly motivated people.

I sincerely wish to appreciate you for attending this maiden event and to warmly welcome you to the city of Minna the capital of the *POWER STATE*. It is a great honour to have you in the beautiful campus of Federal University of Technology Minna, Nigeria, **THE MOST PEACEFUL UNIVERSITY IN NIGERIA**. I am aware of the great sacrifices made by many of you to be present in this occasion and I will definitely not overlook the long distances some of you have had to cover to get to this conference venue. We genuinely appreciate all your efforts. It is our singular hope and desire that the conference meets your expectations and gives you unquantifiable experience and tremendous developmental networking opportunities for a life fulfilling career.

We are grateful for the presence of the Vice Chancellor of the Federal University of Technology Minna – Professor Musbau Adewumi Akanji whose leadership and distinguished academic career has served as inspiration and encouragement to many young academics. His desire to see the University compete at International level has led to the upsurge in the organisation of International conferences, Public lectures and Seminars on regular basis within and outside the university. We are happy to have you as the Chief host to declare the conference open and deliver the welcome address.

We are grateful to the Dean of School of Environmental Technology, Federal University of Technology Professor Yekeen Adeeyo Sanusi for providing the robust platform, academic support and leadership for the organisation of the conference. You threw the challenge and provided the required resources and strategies for achieving its success, it is a great honour of having the opportunity to learn at your feet. We are happy to have you as the host and keynote speaker at the conference. I wish to thank also all the special guests particularly leaders of the Industry, Built Environment and Academia.

SETIC is beginning at the foundation this year and for this I wish to thank all those who have supported us through various forms of participation. Specifically I wish to thank the delegates and the partners for contributing significantly to the conferences. I wish to thank Prof. Oluwole O. Morenikeji (DVC Academic), Prof. Stella N. Zubairu and Prof. A. M. Jinadu who genuinely and consistently monitored the progress of the conference preparations. It is my desire that SETIC becomes a constant feature in the calendar of the university and global conference listings.

Delegates to SETIC 2016 are from 39 different academic and research institutions that are spread across six different countries. This offers participants a wonderful opportunity for exchange of cultural, social and academic ideas during the conference periods. It is also an opportunity to create awareness about programmes and events at the participants' individual institutions. I encourage you all to make good use of the networking opportunities that are available.

We received a total of 226 abstract, based on a quick review we were able to accept 175 of them and the authors were communicated on what they needed to focus on while developing the full papers. A total of (129) full papers were received and reviewed, the reviewers report for the authors to make corrections and submit revised papers. It was after the process that we were able to accept 112 papers for presentation at the conference, I therefore congratulate all the authors whose papers made it to the conference. We acknowledge the amount of hard work you had all put in producing these papers. It is my sincere believe that the presentation of the different ideas in your paper would go a long way in improving the knowledge of the participants and also generate meaningful discussions at the tea beaks, lunch and beyond.

I wish to express my utmost gratitude to each reviewer for a wonderful job done and for tolerating our deadlines and Oliver Twist syndrome. It is your dedication and expertise that has ensured that the conference is a success.

Special thanks to all our keynote speakers, Prof. Oluwole O. Morenikeji (Deputy Vice-Chancellor Academics, Federal University of Technology Minna), Prof. Hussein Makun (Director, Directorate of Research Innovation and Development, Federal University of Technology Minna), Dr. Musa Aibinu (Director, Centre for Distance Learning), Prof. Mustapha Zubairu (Director, Centre for Human Settlement and Urban Development), Dr. Appolonia A. Okhimamhe (Director, WASCAL) and Prof. Yekeen Sanusi, (Dean School of Environmental Technology, Federal University of Technology Minna).

It is important to appreciate the roles and efforts of the following people for their selfless and very significant contributions made towards the successful organization of the conference: Adedokun John, Idowu Oqua, Akhabue Oriwoh and Ailoyafen Dorcas (for being available to run around at very short notice), Arc. Oyetola Stephen and Tpl Samuel Medayese (for typesetting the papers for the conference proceedings).

I have come to realise that it is not easy to organize conference without dedicated individuals offering to serve. My heartfelt gratitude goes to Dr. R.A. Jimoh, Dr. L.O. Oyewobi, Dr. Taibat Lawanson, Dr. P. Ayuba, Dr. J.J. Dukiya, Dr. A.I. Anunobi, Dr. N.I. Popoola and Dr. O.A. Kemiki for their unflinching support all through the process.

It is our sincere hope that this conference will serve as a forum for the advancement of research in the urban sphere towards achieving a sustainable environment. It is our sincere believe that academics and professionals in practices will continually participate in this forum.

Once again I wish to thank you all for creating time out of your busy schedule to attend this conference. Please do enjoy your stay at Federal University of Technology Minna, and the city as a whole. Ensure that you make use of the different fora created throughout the conference to build new relationships for the future and strengthen existing relationships. I look forward to seeing you all in future.

Olatunde Folaranmi ADEDAYO
Chairman SETIC 2016 Organising Committee
May 2016

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DECLARATION

PEER REVIEW AND SCIENTIFIC PUBLISHING POLICY STATEMENT

10th May 2016

TO WHOM IT MAY CONCERN

I wish to state that all the papers published in SETIC 2016 Conference Proceedings have passed through the peer review process which involved an initial review of abstracts, blind review of full papers by minimum of two referees, forwarding of reviewers' comments to authors, submission of revised papers by authors and subsequent evaluation of submitted papers by the Scientific Committee to determine content quality.

It is the policy of the School of Environmental Technology International Conference (SETIC) that for papers to be accepted for inclusion in the conference proceedings it must have undergone the blind review process and passed the academic integrity test. All papers are only published based on the recommendation of the reviewers and the Scientific Committee of SETIC

Names and individual affiliation of members of Review and Scientific Committee for SETIC Conference 2016 are published in the SETIC 2016 Conference Proceedings and made available on www.futminna.edu.ng

Olatunde Folaranmi ADEDAYO
Chairman SETIC 2016
Federal University of Technology, Minna, Nigeria

Papers in the SETIC 2016 Conference Proceedings are published on www.futminna.edu.ng.

REVIEW PANEL

We wish to express our deepest and sincere gratitude to the following people in no particular order who provided comprehensive scientific reviews and made commendable suggestions towards improving the over 200 abstracts and 100 full papers submitted to SETIC 2016. They provided constructive comments to authors regarding their papers, it is necessary to state that there was no reported case of conflict of interest by any of the reviewers or the authors.

Dr. J.J. Dukiya, Department of Transport Technology, Federal University of Technology, Minna

Dr. Naomi I. Popoola, Department of Estate Management, Federal University of Technology, Minna

Dr. Anthony I. Anunobi, Department of Architecture, Federal University of Technology, Minna

Dr. Philip Ayuba, Department of Architecture, Federal University of Technology, Minna

Dr. Taibat Lawanson, Urban and Regional Planning, University of Lagos, Lagos

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Dr. Hassan Ogiri, Department of Building, Federal University of Technology, Minna

Mr. Ismail Ojetunde, Department of Estate Management, Federal University of Technology, Minna

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Dr. Ifeanyi Onuigbo, Department of Surveying & Geoinformatics, Federal University of Technology, Minna

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Dr. Olatunde F. Adedayo, Department of Architecture, Federal University of Technology, Minna

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Dr. Kwasi Awuah, University of West England, UK

Dr. Rotimi University of West England, UK

Dr. Olatunde F. Adedayo, Department of Architecture, Federal University of Technology, Minna

PROFILE OF KEYNOTE SPEAKERS

SETIC 2016 organisers wishes to thank our keynote speakers for accepting to create time to share from their rich wealth of knowledge and interact with delegates and participants on varied issues being examined at this year's conference. A brief profile of each keynote speaker is provided here, this would allow for future interaction and networking with them.

Prof. Hussaini Anthony MAKUN

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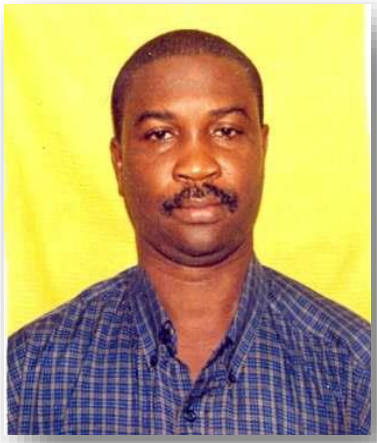
Hussaini Anthony Makun is currently working as Professor of Biochemistry in the Department of Biochemistry, Federal University of Technology, Minna where he has being since 1992. He completed his PhD in 2007 in Biochemistry (Toxicology) from same University. The researcher was a National Research Foundation Postdoctoral Fellow (PDF) with Food Environment and Health Research Group of the University of Johannesburg (UJ) between 2008 and 2010. He is teaching basic and advanced courses in biochemistry, and toxicology related courses at both undergraduate and postgraduate levels.



He has supervised and graduated over seventy B-Tech and ten M-Tech students and two PhDs. He is currently the Lead Researcher of the Food and Toxicology Research Group (FTRG) of the University which has 2 Senior Researchers, 3 M.Tech and 4 PhD students. FTRG conducts researches on environmental health monitoring and mycotoxins at national and international levels. The researches focus on detection and health impacts of mycotoxins and establishing novel integrated intervention strategies approach against mycotoxins. The intervention strategies include exploration of natural preservatives from African traditional medicinal plants with fungicidal effects for production of fungicides for storage of crops. Other approaches at animal farms include formulation of nanoparticle based multi-mycotoxin feed binder against exposure to common, toxic mycotoxins. The research group is also involve in studies to produce simple medicinal supplements encapsulated in

nanoparticles with protective effects against diseases induced by mycotoxins from African traditional medicinal plants; such supplements will alleviate the adverse health impact of mycotoxins in animals and human beings. The research group is also interested in toxicological studies of medicinal plants used in the folkloric treatment and drug toxicology. Following the trend of drugs abuse in Nigeria, the research group is embarking on research titled "Elucidation of the chemical composition and biomonitoring of substances of abuse in the Northern region of Nigeria"**.** The focus of this research is to establish the current state of art of drugs of abuse in the Northern region of Nigeria; to elucidate the chemical composition and active ingredient of new psychoactive substances (NPS); to modify validated analytical methods for the detection of new psychoactive substances in blood, urine and hair.

In last 5 years, 6 research projects were granted with funding from NRF, South Africa and TETFUND, Nigeria. He is a member of Mycotoxicology Society of Nigeria (Vice President (North), Experts on Mycotoxins in Food, Food Hygiene, Food Import/Export Inspections and Certification System of the National Agency for Food and Drug Administration and Control (NAFDAC) of Nigeria, National Codex Committee of Nigeria, African Union Expert Committee on Contaminants in Food (2011 to date) and Joint FAO/WHO Expert Committee on Contaminants in Food (JECFA) (2012-2016). He coordinated the writing of the "discussion paper on fungi and mycotoxins in Sorghum" which was adopted as a document of the Joint FAO/WHO Experts Committee on Food Additives (JECFA) in 2012 and participated in the writing of "Proposed draft annex for "prevention and reduction of aflatoxins and ochratoxin A in sorghum" in the existing code of practice for the prevention and reduction of mycotoxin contamination in cereals (CAC/RCP 51-2003)".

Prof Makun has 57 publications, mostly on mycotoxins in peer review journals, technical papers and books and is currently the Director of Research, Innovation and Development, Federal University of Technology, Minna.

Dr. Appollonia A. OKHIMAMHE

Federal University of Technology, Minna

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Dr A. A. Okhimamhe is the Director of the Masters Research Programme on Climate Change and Adapted Land Use (MRP CC & ALU) of the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL), a German sponsored graduate research programme with its Headquarters in Accra, Ghana.

In collaboration with colleagues, 20 West African students from Nigeria, Ghana, Benin, Togo, The Gambia, Cote D'Ivoire, Mali, Niger and Burkina Faso graduated with Master of Technology (M.Tech) in Climate Change and Adapted Land Use from the University. Another Batch of 10 students are expected to commence their programme in mid 2016. Aside from her academic qualifications, her participation in various training activities organized by the United Nations in Regional Centre for Mapping of Resources for Development in Nairobi, Kenya (1992); University of Stockholm, Sweden (1994); Harare, Zimbabwe (1995); and European Space Research Institute in Frascati, Italy (1997, 1998) had prepared her professionally for her career. Additionally, in 2000, she secured a 6 months fellowship-traineeship for a colleague in the Department and herself at the European Space Research Institute in Frascati, Italy. Dr Okhimamhe is an alumni of the International Visitor Leadership Programme (IVLP), U.S. Department of State's Bureau of Educational and Cultural Affairs' (ECA) premier professional exchange program. Currently, she is an Associate Professor of Geography with a research focus on application of remote sensing and GIS in geographical sciences including climate change.

Dr Okhimamhe has served her country as a Technical Delegate at the UNFCCC COP in Cancun, Mexico (2010), Durban, South Africa (2011), Doha, Qatar (2012) and Warsaw, Poland (2013). She has supervised more than 30 postgraduate students and has several publications and is still publishing. In collaboration with her students in the last 3 years, she has focused on urban climate change studies using geospatial techniques.

Prof. Abiodun Musa AIBINU

Federal University of Technology, Minna

maibinu@gmail.com +2348132483940

Abiodun Musa AIBINU (PhD), is a highly motivated career driven achiever with over Eighteen (18) years working experience in the field of: Mechatronics Engineering; Telecommunication Engineering; Spectrum Management; Industrial Automation; Teaching; Research and Project Development.

He received: National Diploma award from The Polytechnic, Ibadan, Nigeria; B.Sc degree from Obafemi Awolowo University (OAU), Ile-Ife, Nigeria; M.sc degree from Blekinge Institute of Technology (BTH), Sweden and Doctoral degree award from International Islamic University Malaysia, (IIUM), Malaysia. He has been actively involved in teaching and research activities at various universities since the completion of his post-graduate studies. However, prior to that he has worked with: MTN Communication (Nigeria) Limited; GS Telecom (Nigeria) Limited; DCC Satellite and Networks Limited; Oganla Consulting and Investment (OCI) limited; Communications Associates (COMSAC) (Nigeria) Limited just to mention but a few.

Engr. Aibinu has participated and won several awards at various international and national exhibitions and was nominated for 2012 promising researcher award and best teacher award at IIUM Malaysia. He has also won several research grant awards in and outside Nigeria and has authored/co-authored several publications in both local and international journals and conferences.

He is presently, the Head of Department, Mechatronics Engineering Department, Federal University of Technology, Minna and the Director, Center for Open Distance and e-Learning (CODeL), Federal University of Technology, Minna.

Prof. MORENIKEJI, Olakanmi Oluwole

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Morenikeji, Olakanmi Oluwole joined the services of the Federal University of Technology, Minna in 1990 as an Assistant Lecturer and rose to become a Professor of Urban and Regional Planning in 2006. He obtained his B. Sc in Geography and Regional Planning from the University of Calabar in 1983 and M. Sc Urban and Regional Planning from the University of Benin in 1998. He enrolled for his Ph.D in Transport Planning in 1992 at FUT Minna and won a Nigerian-Italian Ph.D scholarship which enabled him to do part of his Ph.D work at the University of Trieste, Italy. He bagged his Ph.D in 1998 and utilized his post-doctoral Commonwealth Fellowship at the Instrumented City, Institute for Transport Studies, University of Leeds, UK (2004/2005).

Morenikeji served as the Head of Department of Urban and Regional Planning from 1995 – 2002 and later, Director of the Centre for Human Settlements and Urban Development established in collaboration with the UN-Habitat in FUT, Minna. He was also the Dean of the School of Environmental Technology from 2008-2012. He has also participated in a number of internationally funded research projects and published several papers in learned journals. His areas of interest include transportation planning, human development studies, spatial analysis and Research Methods.

He is currently participating in a collaboratory research between The Construction and Property Research Centre, University of the West of England (CPRC-UWE), Bristol, UK and the Federal University of Technology (FUT), Minna being funded by DFID. He has been appointed by the West African Science Centre on Climate Change and Adapted Land Use (WASCAL) as a visiting Lecturer at the Joint Facility for Language and Common Courses (JFLCC) 2016 which is a collaborative programmes for Masters (MRP) and Doctoral Research Programme (GRP) students from 10 participating Universities.

Prof. Mustapha ZUBAIRU

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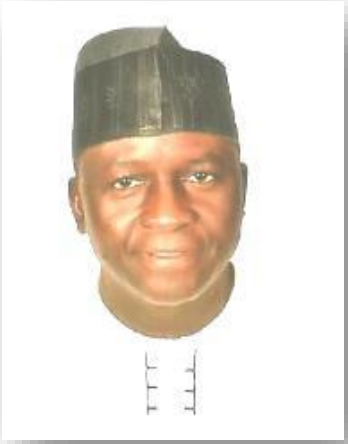
Mustapha Zubairu is currently a Professor in the department of Urban and Regional Planning and the Director Centre for Human settlement and urban development (CHSUD) in the Federal University of Technology, Minna. He received his B.Sc. and M.Sc. degrees in architecture from the Ahmadu Bello University Zaria, Nigeria, in 1975 and 1977 respectively. He also holds M.Sc. and Ph.D. degrees in urban and regional planning from the University of Strathclyde, Glasgow, Scotland 1983 and 1990. He is a Member of the Royal Planning Institute, Member, Nigerian Institute of Architects, Fellow, Nigerian Institute of Town Planners and a Member, Nigerian Institute of Management.



Prof. M. Zubairu was amongst others, a principal architect in the Ministry of Works and Housing, Minna, Niger State from 1979-1981, a Chief Architect/Planner in the Niger state housing corporation between 1983 – 1984 after which he became the general manager Niger State Housing Corporation, Minna between 1984 and 1992. He eventually became the General Manager, Urban Development Bank of Nigeria PLC, in charge of the Lagos Regional Office from 1992 to 1999 were he was trained by World Bank on Project development and appraisal.

In 1999 he was appointed the position of Managing Director/Chief Executive, Federal Housing Authority, Abuja where stayed until 2001. Through a large portion of his tenure (1995 till date) to be exact, he established and was also involved in private practice as principal partner in an architecture and urban planning consultancy firm. In 2003, he was appointed as director, Centre for Human Settlements and Urban Development in the Federal University of Technology, Minna and has retained this position till date. Since his appointment he has been servicing the department of urban and regional planning and architecture as mentor, supervisor and all round resource person.

His area of specialization includes; Housing, Urban design, Urban Management and Slum upgrading.

Professor Yekeen A. SANUSI

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Yekeen A. Sanusi is a Professor of Urban and Regional Planning at the Federal University of Technology, Minna. His lecturing experiences span over 20 years and has lectured at both undergraduate and postgraduate classes. His academic works cover issues on urban environmental quality, urban dynamics, urban governance and green economy (poverty, service delivery and deprivations, water and sanitation, energy and climate change).

He also has studies and reports sponsored by international bodies and Research Board of the Federal University of Technology, Minna. His teaching areas cover planning theory, development control and settlement of disputes, urban governance, project planning and evaluation, energy planning, environmental impact assessment and tourism planning. He has successfully supervised many postgraduate theses (PhD, Master and Postgraduate Diploma). On administrative front,

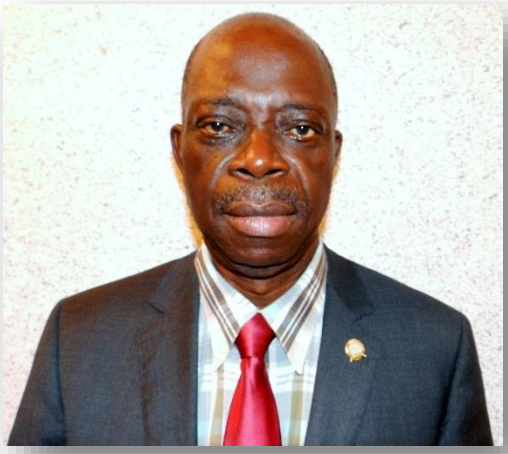
He was Deputy Dean, School of Environmental Technology of the Federal University of Technology, Minna between 2006 and 2008 and the Head of Department, Urban and Regional Planning between 2008 and 2012. Since 2012, he has been the Dean of the School of Environmental Technology. He is a Registered Town Planner (RTP) and a member of Nigerian Institute of Town Planners (NITP).

He is a member of many international research networks. Among these are Environment, Health and Development Network and Renewable Energy Policy Network for the 21st Century.

PROF Johnson Bade FALADE

Executive Director of the Foundation for Development and Environmental Initiatives (FDI)

He is currently the Managing Director/Chief Executive Officer of Gotosearch.Com Ltd and Executive Director of the Foundation for Development and Environmental Initiatives (FDI) from July 20012-date. He is currently a Senior Programme Advisor for the Urbanisation Research Nigeria Project.



Prior to this appointment, Prof Falade was the first Country Director of UN-HABITAT Programme Support office for Nigeria (2003-2012); UNDP (Programme Analyst in the Governance Team (2000-3), UNDP Zonal Officer for the North-West Zone of Nigeria (1998-2000); Programme Officer for Economic Management Team (1994-98); Programme Officer for Water and Sanitation (1992-94).

He was appointed Pupil Town Planner, County Planning Department, County Durham, Durham, UK (1977-78) and Air Mapping Assistant with the Photogrammetry Department, Ministry of Lands and Housing, Ibadan, Nigeria (1968-1970).

Professor Falade has a vast teaching and research experience. He was appointed Assistant lecturer (1982-83), Lecturer 1 (1985-87), Senior Lecturer (1987-91) with the Faculty of Environmental Design and Maanfgement fo the Obafemi Awolow University Ile-Ife. He was a Visiting Professor, Department of Geography and Regional Planning, Adekunle Ajasin University, Akungba, Akoko, Ondo State (2005-7); He was Visiting Associate Professor, Department of Urban and Regional Planning University of Lagos, Lagos (1998-90); Visiting Lecturer Department of Geography and Regional Planning Lagos State University, Ojoo (1998).

Professor Falade is member of several Professional Bodies: namely Nigerian Institute of Town Planners (1984-till now), Fellow of the Institute (1999-till date); Town Planners Registration Council (1986-till date); Nigerian Construction Industry Academy (1986-to-date); Nigerian Institute of Management (NIM) and International Union on Parks and Recreational (2004-to-date).

Professor Falade has been awarded many national and international awards. He has several publication to his credit in the areas of urban planning, landscape design and conservation and urbanization and urban governance.

SCHOOL OF ENVIRONMENTAL TECHNOLOGY INTERNATIONAL CONFERENCE (SETIC) 2016 PROGRAMME

DAY ONE	**TUESDAY**	**10TH MAY 2016**
	07.30 – 09.00	**REGISTRATION**
	09.00 – 10.50	**OPENING SESSION (SET LECTURE THEATRE)** **Chairman Opening Session: Prof. J.M. BABA Department of Geography, Federal University of Technology, Minna**
	09.00 – 09.10	Welcome and Introduction of Delegates and Guest – Olatunde Adedayo
	09.10 – 09.15	University Anthem
	09.15 – 09.25	Welcome Address by the Dean, School of Environmental Technology, Federal University of Technology, Minna **– Prof. Y.A. SANUSI,**
	09.25 – 09.40	Recognition of Conference Reviewers
	09.40 – 09. 55	Goodwill Messages from Sponsors and Partners
	09.55 – 10.20	**CONFERENCE LECTURE** **Integrating Climate Change Adaptation Strategies into Urban Designs: A Must for Today's Built Environment Professional - Dr. A.A. OKHIMAMHE** ***Director, West African Science Service Centre of Climate Change and Adapted Land Use***
	10.20 – 10.35	Conference Opening Speech and Declaration by the Chief Host: Vice-Chancellor of Federal University of Technology, Minna, Niger State, NIgeria - **Prof. Musbau Adewumi AKANJI**
	10.35 – 10.50	Close of Opening Ceremony and SETIC 2016 Group Photographs
	10.50 – 11.10	**TEA BREAK**
	11.15 – 12.40	**PLENARY SESSION I** **Chairman of Session: Prof. M.G.M. Kolo, Dean Postgraduate School, Federal University of Technology, Minna** **Session Rapporteur: Dr. R.E. Olagunju, Federal University of Technology, Minna**
	11.15 – 11.35	**Plenary Paper I** **Evolving An Effective Research And Innovation System For National Development And Unity In Nigeria -** ***Prof. Hussaini Anthony Makun, Director, Research, Innovation and Development***
	11.35 – 11.55	**Keynote Paper II** **Technological Trends IN ENGINEERING as Applicable to Environmental Technology** **-** ***Prof. M. Aibinu, Director CODEL Federal University of Technology Minna.***
	11.55 – 12.05	**Q&A Dr. R.E. Olagunju**
	12.05 – 12.25	**Plenary Paper III** **Future Trends for Research in Urban Development. –** ***Prof. M. Zubairu, Director Centre for Human Settlement and Urban Development, Federal University of Technology, Minna***
	12.25 – 12.35	**Q&A Dr. R.E. Olagunju**
	12.35 – 12. 40	**Session Chair Remarks**
	12.45 – 13.50	**LUNCH**

	13.50 – 15.50	**PARALLEL SESSION 1**		
		STREAM 1 (LECTURE THEATRE)	STREAM 2 (PG SEMINAR ROOM)	STREAM 3 (SET BOARD ROOM)
	Chair	**Prof. Y.A. Sanusi** **Federal University of Technology Minna**	**Dr. L. Oyewobi** **Federal University of Technology Minna**	**Prof. S.N. Zubairu** **Federal University of Technology Minna**
	Rapporteur	**Dr. M. Dalil**	**Dr. N.I. Popoola**	**Dr. I.A. Olatunji**
	Theme	**Urban Resilience and Energy Conservation**	**Infrastructure Development and Financing**	**Conceptual Issues on Climate Change and Sustainable Development**
	13.50 – 14.00	Adaptation Of Passive Cooling Strategies In Hostels Of Tertiary Institutions, Niger State - *Bello Joseph Enesi, Oriwoh Akhabue & Adedayo Olatunde Folaranmi*	Assessment Of Real Estate Investment Activities Of Insurance Companies In Nigeria - *Mohammed Danlami Inuwa, Sidi Isah, Mohammed Umar Faruck & Ahmed Maimuna Larai*	Landscaping For Passive Security And Adaptation For Climate In Church Environment Niger State, Nigeria - *Ailoyafen, Dorcas, Adedayo, Olatunde Folaranmi & Adebayo Oluwatoyin Abiodun*
	14.00 -14.10	Resilient Cities As A Pivotal Component Of Climate Variability Mitigation: Lesson For Nigerian Cities - *Medayese, O.B., Abd'razack, N.T.A, Medayese, S.O. & Dalil, M*	Examination Of Housing Investment Performance In Abuja, Nigeria - *Wahab, Babatunde M. Durosinmi, Wasiu A., Mustapha Adamu, I.A Olatunji & M.T.A Ajayi*	Retrofitting Faculty Building With External Balconies For Adaptation To Climate Change - *Onwuka, Bridget Nneoma, Yusuff, Taiwo Qasim & Adedayo, Olatunde Folaranmi*
	14.10 – 14.20	Q&A		
	14.20 – 14.30	Modeling The Energy Profiles Of Typical Buildings In Nigeria: A Case Study Of Sokoto, Oshogbo And Minna - ***Mambo Abdulhameed Danjuma & Mustapha Zubairu***	Infrastructure Development And Financing For Sustainable Housing Delivery In Nigeria: A Review - *Atamewan, E. E & Tabuko, B. D*	Soil Carbon Dioxideefflux In Three Different Canopy Densities Of Tropical Forest, Peninsular Malaysia - *Mande Kato Hosea, Ahmad Abdullah Makmom, Ahmad Zaharin Aris, Ahmad Ainuddin Nuruddin & Suleman, Ezekiel Nghai*
	14.30 – 14.40	Day Lighting And Sustainability Of Office Complexes In Niger State - *Dauda Abubakar Dada, I. M. Kontagora, Ibrahim S.Mohoro, Abubakar Wuna & Yalwa Atukur*	Modeling The Effect Of Changes In The Price Of Construction Materials On The Rate Of Development In Abuja - *Olasanmoye, R. S. & Idiake, J. E.*	Sustainable Bus Terminal Design With Adaptation To Climate Change - *Abba Mark Terlumun & Anunobi, A.I.*
	14.40 – 14.50	Q&A		
	14.50 – 15.00	Walk-Though Energy Audit Exercise On Office Buildings Of Kaduna Central Bussiness District; Nigeria - *Salihu Murtala Muhammad, Ejeh David & Hassan Ozovehe Saliu*	Work-Life Balance Among Women Construction Workers: A Conceptual Approach - *Oyewobi, Luqman Oyekunle & Adeneye, Toyin Deborah*	Investigation Of The Effect Of Sea Level Variation On Vertical Reference Frames Based On A Designed Experiment - *Odumosu, J. O., Idowu, T. O., Adesina, E. A., Ajayi, O. G. & Ibrahim, P.*
	15.00 – 15.10	Evaluation Of Passive Cooling Techniques In Government Office Buildings In Minna Niger State Nigeria - *Michael, B. U & Olaniyan, O.A.*	Bridging Communication Gap At Construction Sites In Abuja: The Pidgin English Advantage - *Bamgbade, Adebisi Abosede & Jimoh, Richard Ajayi*	Climate Change, Related Events And The Challenge Of Sustainable Environmental Quality: The Nigerian Experience - *Uyobong Sunday Etuk, Nyeneime Victor Raphael & Edidiong Elijah Usip*

	15.10 – 15.20	Q&A		
	15.20 – 15.25	**Session Chair Remarks**		
	15.25 – 15.40	**SNACK BREAK**		
	15.40 – 16.30	**PARALLEL SESSION 2**		
		STREAM 1 (LECTURE THEATRE)	STREAM 2 (PG SEMINAR ROOM)	STREAM 3 (SET BOARD ROOM)
	Chair	**Prof. A.M. Jinadu** **Federal University of Technology Minna**	**Dr. J.E. Idiake** **Federal University of Technology Minna**	**Dr. M.I. Bala** **Federal University of Technology Minna**
	Rapporteur	**Dr. N.T.A. Abdurazzaq**	**Dr. M. Yakubu**	**Dr. A.D. Isah**
	Theme	**Urban Resilience and Energy Conservation**	**Infrastructure Development and Financing**	**Conceptual Issues on Climate Change and Sustainable Development**
	15.40 – 15.50	Municipal Solid Waste Conversion To Energy And Derived Chemicals Using Pyrolysis - *Muhammad Abdul-Qdir, M.A. Olutoye, D.O. Agbajelola, O.D. Adeniyi & E.J. Eterigho*	The Challenges Of Cost Management Of Infrastructure Development In Nigeria - *Kasimu A. Muhammad*	Investigation Of The Impact Of Sunspots On Earth's Climate - *Ajayi, O. G.; Ibik, A. L.; Odumosu, J. O.; Babalola, K. H. & Adesina, E. A.*
	15.50 – 16.00	Assessment Of Quality Of Neighbourhood As Determinant Of Choice Of Location Among Residents In Bosso And Kpakungu Residential Areas Of Minna, Niger State - *Altine Maxwell Kyon, Sum Habila Ezekiel & Terzungwe Dugeri*	Examination Of Factors Affecting Accuracy Of Valuation For Secured Lending In Abuja, Nigeria - *Charles-Afolabi Christianah Yetunde & Olatunji Ayodele*	Assessment Of Bioclimatic Priciples In The Design Of Public Spaces In Minna - *D.O. Alonge, S.A. Oyetola, G.O. Adebisi, O.J. Onuwe, A.U. Attah & Tauheed, A.I.*
	16.00 – 16.10	Q&A		
	16.10 – 16.20	Lighting Performance of A Faculty Building: A Case Study Of Federal University Of Technology Minna - *Mambo Abdulhameed Danjuma & Opayemi Idowu Opeyemi*	**Arbitration As An Alternative Dispute Resolution In Real Estate - *Olatunji Olajumoke Omotola***	Review And Development Of An Algorithm For Carbon Dioxide Emission Monitor In Automobile - *Musa Nicholas Akhaze & Agajo James*
	16.20 – 16.30	Assessment Of Natural Ventilation In Public Office Buildings: Case Study Of Selected Public Office Buildings In Niger State - *Igwe, Echezona Chukwuebuka & Abdulrahaman, Mukaila El-Hussain*	Financial Risk Associated with Housing Estate Project Development - *Umar, Muhammad Kabir & Ibrahim Ahmad Doko*	Sustainable Built Environment and Climate Change; The Place of Neighbourhood Security and Effective Property Management in Neighbourhoods of Bida, Niger State - *Umar A. Saidu, Mamman Mathew & Maxwell Chidi Duru*
	16.30 – 16.40	Q&A		
	16.40 – 16.45	**Session Chair Remarks**		
	16.40 – 17.00	**CLOSE**		

DAY TWO	**WEDNESDAY**	**11TH MAY 2016**		
	08.40 – 09.00	**Highlights of Day One Dr. R.A. Jimoh**		
	09.00 – 09.55	**PLENARY SESSION II** **Chairman of Session: Prof. I.N. Mogbo, Department of Science Education, Federal University of Technology, Minna** **Session Rapporteur: Dr. I.C. Onuigbo, Federal University of Technology, Minna**		
	09.00 – 09.05	**Session Chairman Remarks**		
	09.05 – 09.25	**Plenary Paper IV** **Making a Good Research Presentation and Research Ethics.** **- *Prof. O.O. Morenikeji,* Deputy Vice-Chancellor Academics, Federal University of Technology, Minna**		
	09.25 – 09.45	**Plenary Paper V** **Managing Time and Resources for Research and Teaching.** **- *Prof. Y.A. Sanusi,* Dean School of Environmental Technology, Federal University of Technology, Minna**		
	09.45 – 09.55	**Q&A Dr. I.C. Onuigbo**		
	10.00 – 11.05	**PARALLEL SESSION 3**		
		STREAM 1 (LECTURE THEATRE)	STREAM 2 (PG SEMINAR ROOM)	STREAM 3 (SET BOARD ROOM)
	Chair	**Dr. A.A. Okhimamhe Federal University of Technology Minna**	**Prof. H. A. Makun Federal University of Technology Minna**	**Prof. M. Zubairu Federal University of Technology Minna**
	Rapporteur	**Dr. A.I. Anunobi**	**Dr. A.E. Abalaka**	**Dr. P. Ayuba**
	Theme	**Climate Change and Threat to Sustainability of the Built Environment**	**Waste Management and Sanitation**	**Sustainable Practice Theories**
	10.00 – 10.10	Review Of Changes In Climate And Sustainable Urban Develoment In Akure Metropolis – Akure *Josephine. O. & Zacchaeus, Mayowa. E*	Assessment Of Solid Waste Management In Akure, Nigeria - *Adebayo, Michael Adedayo and Mbazor, David Ngwoke*	Adaptation And Flexibility Of Space In Sustainable Hospital Design In Niger State - *Akerele Adesola Olaronke & Adedayo Olatunde Folaranmi*
	10.10 – 10.20	Adapting to Climate Change Flooding Impacts- A Guide For Achieving Sustainable Built Environment In Nigeria - ***Bello Nurudeen Akinsola, Adepoju Adetoye Sulaiman & Adeogun Adekunle Sunday***	Assessment of Solid Waste Management Practices in Makera Ward Of Minna Niger State - *Salihu, Suleiman, Suleiman, Aisha Nana & Shuaib, Iklimah*	Comparative Analysis Of Low-Tech Sustainable Housing Projects In Abuja and Environs - *Oluigbo Stephen Nwabunwanne & Danjuma Golesh Abel*
	10.20 – 10.30	Q&A		
	10.30 – 10.40	Confronting The Challenge Of Climate Change On Built Environment In Nigeria: Utilizing A Resilient Response - *Tauheed, I. A. & Alonge, D.O.*	Assessment Of Household Solid Waste Management Techniques In Some Selected Informal Settlements In Minna, Niger State, Nigeria - *Shuaib Iklimah, Salihu Suleiman, Aisha, Nana Suleiman & Dauda, Abubakar Dada*	Design Consideration For Ecological And Green Design In Shopping Centres In Minna Niger State, Nigeria - *M.I. Bala & Metu John*

	10.40 – 10.50	Climate Change And Its Threats To Sustainable Built Environment - *Onuigbo Ifeanyi Chukwudi*	Evaluating The Spatial Distribution Of Open Dumpsites And Their Effects On The Residents In Bosso-Minna, Nigeria - *Salamatu Kassah, Abdullahi A. Kuta, Nanpon Zitta, Oluibukun G. Ajayi, Semiratu W. Abdullahi & Idris M. Kontagora*	Green Architecture: The Perception Of Nigerian Architects - *Elimisiemon Monday Chris, Damen Moeduutman Raymond & Garba Hyeladzira Msheila*
	10.50 – 11.00	Q&A		
	11.00 – 11.05	**Session Chair Remarks**		
	11.00 – 11.20	**TEA BREAK**		
	11.20 – 12.55	**PARALLEL SESSION 4**		
		STREAM 1 (LECTURE THEATRE)	STREAM 2 (PG SEMINAR ROOM)	STREAM 3 (SET BOARD ROOM)
	Chair	**Dr. Aishatu Abdulkadir** **Federal University of Technology Minna**	**Dr. A. Saka** **Federal University of Technology Minna**	**Prof. S.N. Zubairu** **Federal University of Technology Minna**
	Rapporteur	**Dr. B. Olawuyi**	**Dr. H. Ogiri**	**Dr. E. Umaru**
	Theme	**Climate Change and Threat to Sustainability of the Built Environment**	**Waste Management and Sanitation**	**Sustainable Practice Theories**
	11.20 – 11.30	Emission Reduction At The Exhaust Of A Diesel Internal Combustion Engine By Partial Flow Technology - *Musa Nicholas Akhaze & Fatona Stephen Ayodele*	Assessment Of Storm Water Drainage System In Selected Housing Estates In Minna Niger State - *Dauda Abubakar Dada, Shuaib Iklimah, Makun Christopher Sunday & Nasiru Salihu*	Integration Of Key Design Elements For Play-Learning Environment In Elementary Schools In Minna, Nigeria - *Akpama, D. S. & Ayuba, P.*
	11.30 -11.40	Climate Change And Treats To Sustainability Of The Built Environment: The Impact Of Charcoal As A Source Of Domestic Cooking Energy On The Built Environment, A Case Study Of Niger State - *Ndawashi B. M., Morenikeji F. T., Salihu U. T., & Otijele G. O.*	Integration Of Organic Sloid Waste Recycling For Improving The Environmental Sustainability Of Hotels In Minna, Niger State, Nigeria - *Otomi Peter*	Mitigating Climate Change Through Green Architecture - *Elimisiemon, Monday Chris, Raymond, L. Damen &* *Hyeladzira, Msheila Garba*
	11.40 – 11.50	Q&A		
	11.50 – 12.00	Human Contributions Towards The Devastation Of Flood On Communities In Kaduna State - *Salihu Usman Tyabo, Morenikeji Fisayo Teniola, Muhammad Bello Ndawashi & Otijele Godwin Omachoko*	Assessment On Refuse Disposal Techniques In Housing Estates Of Minna, Niger State - *Morenikeji Fisayo Teniola,* *Salihu Usman Tyabo, Ndawashi Bello Mohammed & Otijele Godwin Omachoko*	Understanding The Role The Architect Plays In Attaining Sustainable Design And Construction - *Ajufoh Michael Onyemaechi, Dauda Ali, & Yaktor J. L,*
	12.00 – 12.10	Environmental Impact of Construction of Gen. M.I Wushishi Housing Estate On Vegetation and Climate - *Muhammad*	Effect Of Solid Waste Management On Residential Quarters In Akure, Nigeria - *Victor Olufemi Adegbehingbe & Sunday Adeluyi Bobadoye*	Use Of Open Spaces In Improving Office Building Sustainability In Tertiary Institutions - *Oqua, Idowu Titilope &* *Adedayo, Olatunde Folaranmi*

		Abdullahi ABDULSALAM & Abdulahi Sule ARGUNGU		
	12.10 – 12.20	Climate Change, the Segregational Application, the Gwagwalada Experience - *Ekweghariri, L. C., Shaibu, S. I., Owoyele, S.G. & Idowu, O. O.*	Factors Influencing Households' Waste Separation Behaviour In Lagos Metropolis - *Ilechukwu, Victor and Chukwukaora, Ebere*	Assessment Of The Impact Of Partition Materials On Flexibility Of Spaces In Selected Commercial Offices In Minna - *Muhammed, Bashir Ajala & Anthony I. Anunobi*
	12.20 – 12.30	Q&A		
	12.30 – 12.40	The Socio-Cultural Effect Of Changing From Traditional To Modern Architecture In Nigeria, 1915- 2015 - *Eze, Chukwudum J. & Zubairu, S. N.*	Assessment Of Explosion Protection Measures In Commercial Complexes In Abuja, Nigeria - *Ahmed Salawu & Lawal Mohammed*	Green Building Construction In Abuja: The Matters Arising - *Rasheed Babatunde Isa, Paul Abayomi Bajere, Richard Ajayi Jimoh & Usman Shittu*
	12.40 – 12.50	Q&A		
	12.50 – 12.55	**Session Chair Remarks**		
	12.55 – 13.55	**LUNCH**		
	14.00 – 15.55	**PARALLEL SESSION 5**		
		STREAM 1 (LECTURE THEATRE)	STREAM 2 (PG SEMINAR ROOM)	STREAM 3 (SET BOARD ROOM)
	Chair	**Dr. S. Oluigbo** **Ahmadu Bello University Zaria**	**Dr. M. Olutoye** **Federal University of Technology Minna**	**Dr. A. Onumanyi** **Federal University of Technology Minna**
	Rapporteur	**Dr. M.T.A. Ajayi**	**Dr. I. Babangida**	**Dr. B. Banki**
	Theme	**Sustainable Materials**	**Health and Safety Issues**	**Cross Cutting Issues**
	14.00 – 14.10	Effects Of Palm Kernel Shell As Coarse Aggregate Replacement On Strength Properties Of Concrete - *Akogu Elijah Abalaka, Ohiku Muhammed Enejiyon & John Moses*	Effectiveness Of Froth Flotation Method For The Beneficiation Of Baban Tsauni (Nigeria) Lead-Gold Ore - *E.A.P. Egbe, E. Mudiare, O.K.Abubakre[1], M.I. Ogunbajo*	3D Modeling of Structures Using Terrestrial Laser Scanning Technique: Case Study Faculty Of Engineering, University of Lagos - *Oseni, Ayokunle Ebenezer*
	14.10 – 14.20	Effects Of Waste Burnt Brick Powder On Strength Of Concrete - *A. E Abalaka, M. G Abubakar, N. Haruna & J. Moses*	Assessment Of Fire Safety Provisions In Tertiary Institution Hostel Buildings In Niger State - *Aliyu, Waziri Ibrahim, & Abdulrahman, Mukaila El-Hussain*	Assessment Of Insecurity Challenges In Nyanya Area Of Abuja, Nigeria - *V. E Matins, S.O Medayese, G. Danlami, S.I Shaibu & C.B Ohadugha*
	14.20 – 14.30	Q&A		
	14.30 – 14.40	Influence Of Oil Palm Plantation Age And Hydrology On Dissolved Organic Carbon Concentration Of Malaysian Tropical Peatland Water Resources - *Adesiji, R.A., Mohammad, T.A., Nik, N.N.D., Sayok, A.K., Padfield, R., Evers, S., Jimoh, I.O. & Gbadebo, A.O.*	Location-Allocation Analysis Of Public Health Site Selection Using P-Centre Model: (Case Study Of Chanchaga Local Government Area, Minna, Niger State) - *Adesina, E. A, Odumosu, J.O, Zitta. N, Ajayi, O.G, Kuta, A.A, & Adamu, G.M*	Assessment Of The Effect Of Communal Conflicts On Residential Segregation In Kaduna Metropolis, Kaduna State, Nigeria - *Dalil, M, Sulyman, A. O. & Dantudu, A. S. U.*
	14.40 – 14.50	Potential Of Compressed Earth Blocks For Large Scale Affordable Housing Development In Nigeria - *Obaje Juliet A., P. Bajere & P. Ayuba*	Assessment Of Wheelchair Accessibility In Faculty Buildings At The Federal University Of Technology Minna –	Evaluation Of User Satisfaction In Selected Students Halls Of Residence, University Of Ibadan, Nigeria - *Akinluyi, Muyiwa Lawrence & Nasamu, Raphael*

			R.E. Olagunju, P. Ayuba, M.E Abdulrahman, S.A Oyetola, D.O Alonge & M.B Ajala	
	14.50 – 15.00	Q&A		
	15.00 - 15.10	Particle Size Distribution Methods As Adopted For Different Materials - *B.J. Olawuyi & S. Asante*	Public Transport Operations And Mobility Needs Of The Elderly In Lagos, Nigeria - *O.O.Agunloye & O.A. Adeniji*	Tenure Security Due To Unresolved Residential Land Disputes In Kaduna: Challenges And Way Forward - *Mamman Matthew, Saidu A. Umar & M. B. Nuhu*
	15.10 – 15.20	Recycling Of Deconstructed Building Materials From Selected Urban Renewal And Renovation Projects In Minna, Niger State - *Ayuba, P. & Albert, B. S.*	Viability Of Fire Escape Routes In The Student Hostels At Selected Katsina State Tertiary Institutions - *Shittu, Abdullateef Adewale, Idiake, John Ebhohimen, Oyewobi, Luqman Oyekunle, Tsado, Abel John, Bilyaminu, Badamasi & Mac-Barango, Dumo O.*	Design Consideration For Crowd Control In Religious Buildings: A Case Study Of Mosque Buildings In Niger State, Nigeria - *Oyerinde, Babatunde Rasheed*
	15.20 – 15.30	Q&A		
	15.30 – 15.40	Compressed Earth Bricks For Sustainable Built Environment In Nigeria - *Obaje Juliet A., M. Zubairu & Ryal-Net Marcus Balah*	Reducing Accidents and Health Hazards In The Nigerian Building Industry - *Eze, Chukwudum J., Ayuba, Philip &* ***Shittu,*** *Abdullateef Adewale*	The Adequacy Of Relaxation Spaces For Students In Selected Faculty Buildings In Niger State - *Afolabi O. M., Mustapha M., S.K. Goshi & A. I. Anunobi*
	15.40 – 15.50	Q&A		
	15.50 – 15.55	**Session Chair Remarks**		
	15.55 – 16.10	**SNACK BREAK**		
	16.10 – 16.40	**URBANISATION RESEARCH NIGERIA SESSION 1**		
	16.40 - 16.50	**Q&A Dr. O. A. Kemiki**		
	16.50 – 17.15	CLOSE		

DAY THREE	**THURSDAY**	**12TH MAY 2016**		
	08.40 – 09.00	**Highlights of Day Three Dr. L.Oyewobi**		
	09.00 – 09.45	**URBANISATION RESEARCH NIGERIA SESSION 2**		
	09.45 – 09.55	**Q&A Dr. O.A. Kemiki**		
	10.00 – 11.00	**PARALLEL SESSION 6**		
		STREAM 1 (LECTURE THEATRE)	STREAM 2 (PG SEMINAR ROOM)	STREAM 3 (SET BOARD ROOM)
	Chair	**Dr. P. Bajere** **Federal University of Technology Minna**	**Prof. A.M. Jinadu** **Federal University of Technology Minna**	**Dr. J.J. Dukiya** **Federal University of Technology Minna**
	Rapporteur	**Arc. S.A. Oyetola**	**Dr. A.I. Anunobi**	**Dr. P. Ayuba**
	Theme	**Designing the Human Settlement for Climate Change**	**Climate Change Induced Disaster**	**Cross Cutting Issues**

	10.00 – 10.10	Assessing The Impact Of Kaduna State University, Kafanchan Campus On Its Host Community, Binzom – The Beginnings Of An Unsustainable Rural Transformation In Binzom Community - *Musa Sylvanus Hassan & Shamang Kasham*	Innovative Approaches To Flood Resilience In Vulnerable Urban Communities: Experiences Of Women In Makoko - Lagos, Nigeria - *Lawanson, T. & Odunbaku, O.*	Assessment Of Passive Security Design Considerations In Shopping Complexes In Minna, Niger State - *Yisa, Emmanuel Yisa & Anthony I. Anunobi*
	10.10 – 10.20	Assessment Of The Implications Of Urban Growth In Suleja Between 1987 And 2014 - *Adeleye, B. M., Sulyman, A.O., Medayese, S.O., Ayangbile, O. A. & Popoola, A.*	Flooding And The Livelihood Of Residents Along Benue River, Makurdi - *Nenger-John Danjuma E.T & Umar Haliru Vulegbo*	Integration Of Outdoor Relaxation Spaces In Hospital Buildings In Abuja For Staff Satisfaction - *Yusuff, Taiwo Qasim, Onwuka, Bridget Nneoma & Adedayo, Olatunde Folaranmi*
	10.20 – 10.30	Q&A		
	10.30 – 10.40	Users Perception On Landscape Features Of Office Buildings In Abuja Nigeria - *Adedokun Adebayo John, Adedayo Olatunde Folaranmi, Adebayo Oluwatoyin Abiodun & Anunobi Anthony Ikechukwu*	Impacts Of Climate Change On Flooding Incidence In Zaria, Nigeria - *Kubai Zonkwa*	Theoretical Evaluation of Art Elements and the Relationships with Design Activities in Architecture- *A.S.ALFA*
	10.40 – 10.50	Integration Of Recreational Spaces In Hotel Buildings To Improve User Comfort In Minna, Niger State - *Abubakar, Olaitan Abdulrazak*	Effect Of Flood Disaster On The Food Security Status Of Cassava Farmers In Kogi State, Nigeria: Emerging Issues For The Post 2015 Universal Sustainable Development Agenda - *Coker, Ayodeji Alexander Ajibola; Adebayo, Cornelius Owoniyi, & Chidiebere, Ezine Gift*	Assessment Of Spontaneous Physical Housing Changes In Urban Centres Of South West Nigeria - *Abdulrahman, M.E., Olagunju R.E., Morenikeji, O.O. & Jinadu, A.M.*
	10.50 – 11.00	Q&A		
	11.00 – 11.05	**Session Chair Remarks**		
	11.05 – 11.20	**TEA BREAK**		
	11.25 – 13.10	**PARALLEL SESSION 7**		
		STREAM 1 (LECTURE THEATRE)	STREAM 2 (PG SEMINAR ROOM)	STREAM 3 (SET BOARD ROOM)
	Chair	**Prof. Y.A. Sanusi** **Federal University of Technology Minna**	**Dr. S. Ojoye** **Federal University of Technology Minna**	**Dr. O.A. Kemiki** **Federal University of Technology Minna**
	Rapporteur	**Dr. R.E. Olagunju**	**Dr. A.I. Anunobi**	**Dr. B. Olawuyi**
	Theme	**Designing the Human Settlement for Climate Change**	**Climate Change Induced Disaster**	**Infrastructure Development and Financing**
	11.25 - 11.35	The Impact Of Housing Transformation On The Quality Of The Environment Of Residential Buildings In Government	Climate Change Induced Disasters - *Nwose, I.A., Gbedu, A.M. & Ibrahim P.O.*	Route Re-Alignment Survey For Cost Effective Construction Of A Connecting Bridge Over Suleja-Dam - *Ibrahim, O.P.,*

		Estates In South Western Nigeria - *Victor Olufemi Adegbehingbe*		*Mark, Z., Isau, A.I., Samaila-Ija, H.A., Ajayi, O.G. & Nwadilor, I.J.*
	11.35 – 11.45	Assessment Of Neighbourhood Infrastructure Conditions In Minna, Nigeria - *Popoola, Naomi Ijadunola*	Distribution Patterns Of Federal And State Road Network In Imo State (2000 – 2014) - *Idike John Ebhohimen[1*], Shittu Abdullateef Adewale, Adaji Edna Eleojo & Akanmu William P.*	Building A Modern Land Administration System In Nigeria - *Kemiki O. A., Ayoola, A. B., Kuma, S. S., Ojetunde, I. & Fabunmi, F. O.*
	11.45 – 11.55	Q&A		
	11.55 – 12.05	Strategies For Improving Informal Interaction In Study Of School Of Environmental Technology, Federal University Of Technology, Minna, Using Isovist Visibility Graphs - *Oyetola, S.A., Zubairu, S.N., Adedayo, O.F. Alonge, D. O. & Eri, P.O.*	Assessment Of Ergonomic Factors Among Non-Academic Staff Of School Of Environmental Technology, Federal University Of Technology Minna - *Y.D. Mohammed, P.O. Alumbugu & R.A. Jimoh*	Evaluation Of Site Progress Records For Effective Project Management In Abuja, Nigeria - *Bajere, Paul Abayomi & Mohammed, Nasiru Abubakar*
	12.05 – 12.15	Residents' Intra-Urban Mobile Phone Usage and Travel Demand In Somolu Local Government Area, Lagos, Nigeria - *Peter Olulade FOSUDO, O.O. AGUNLOYE & O. A. BANJO*	Factors Affecting Project Planning Efforts In Akwa-Ibom State - *Olubajo .O. Oluseun, Godwin Idoro & R. A. Jimoh*	Challenges Of Property Rating Assessment In Karu Local Government Area Of Nasarawa State - *Celina, A., Kolo, M.Z. & Ajayi, M.T.A*
	12.15 – 12.25	Q&A		
	12.25 – 12.35	Assessment Of User's Perception Of Landscape Provided In Faculty Buildings In Tertiary Institution, Kogi State - *Otijele Godwin Omachoko, Salihu Usman Tyabo, Muhammad Bello Ndawashi & Morenikeji Fisayo Teniola*	Review of Effects of Variation Order on Total Cost and Schedule in Refurbishment Projects - *BABANGIDA Ibrahim, ABDULAZEEZ Abdulmumin & IDIAKE John*	Stratospheric Ozone Variability: An Implication For Climate Change Over Some Selectected Stations In Northern Nigeria - *Ojoye, S. & Sulyman, A.O.*
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	12.55 -13.05	Q&A		
	13.05 – 13.10	**Session Chair Remarks**		
	13.10– 14.10	**LUNCH**		
	14.10 – 14.30	**Conference Summary - Dr. R.A. Jimoh**		
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	15.00 – 15.15	CLOSING REMARKS Prof. Y.A. Sanusi, Dean School of Environmental Technology, Minna		
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SECTION 1: KEYNOTE PAPERS

TECHNOLOGICAL TRENDS IN ENGINEERING AS APPLICABLE TO ENIVIRONMENTAL TECHNOLOGY

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Several revolutionary advancements have been witnessed within the last three centuries. Currently, the world is witnessing the 'Mechatronics' revolution, characterised by real-time prototyping, dynamic innovation and high speed of information exchange. Mechatronics approach unlike other traditional approaches has brought about efficient and effective products and services delivery without quality degradation. More importantly, this revolution has continued to satisfy the need for a sense of feel and touch through advance manufacturing and prototyping techniques.

The traditional method of prototyping, architectural and urban planning techniques could not afford the present yearning of having a feel, touch and more detailed perspective of intending projects prior to commencement. Hence, preventing a luxurious touch of perfection that could have been added to the conceived idea. Recent technological advancement in Mechatronics Engineering has come handy in providing solution to the aforementioned problems by the introduction of 3D printing technique.

The 3D printing revolutionary approach has come as a succour in providing a feel, touch and more detailed perspective of intended projects prior to commencement. With a 3D printer, a 3D model of the intended project can be produced within minutes. The printed model has been shown to provide the desired sense of feel, touch and detailed perception, walk through, analysis and visual inspection of important aspect of the project even at the prototype stage. This definitely answers lots of questions than just showing paper work or 3D movie of the proposed project.

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AIBINU, A.M. (2016). **TECHNOLOGICAL TRENDS IN ENGINEERING AS APPLICABLE TO ENIVIRONMENTAL TECHNOLOGY** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

Furthermore, other Mechatronics approaches introduced recently as applicable to built environment include Unmanned Aerial Vehicle (UAV) and 3D map producing software, Embedded System Development etc. UAVs have been applied in various fields among which include surveying; urban planning; disaster response and management; estate management etc. Similarly, 3D map producing software have also been used in producing 3D maps of surveyed areas in a matter of minutes. Most of these software comes with user-friendly interfaces and can be used on portable devices.

In conclusion, architectural design, building technology, surveying, Urban and regional planning and other related fields in environmental technology can leverage on Mechatronics revolution in enhancing products and service delivery without loss of time and quality.

INTEGRATING CLIMATE CHANGE ADAPTATION STRATEGIES INTO URBAN DESIGNS: A MUST FOR TODAY'S BUILT ENVIRONMENT PROFESSIONAL

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The built environment, urban infrastructure systems and services and ecosystem services will be profoundly impacted by climate change through increased frequency, intensity, and/or duration of extreme weather events such as heavy rainfall, warm spells and heat events; drought, intense storm surges, and associated sea level rise (IPCC, 2007, 2012; Hunt and Watkiss, 2011; Romero-Lankao and Dodman, 2011; Rosenzweig et al., 2011). These will not only affect the economy and population, but also exacerbate the existing socio-economic and environmental drivers of risk for the most vulnerable. Thus adapting existing and new buildings to climate change requires knowledge and innovation in the provision of affordable housing with structural integrity that is climate resilient and can withstand extreme weather as well as incorporate health and safety considerations (UNISDR, 2009; 2011).

Studies have projected that, in Nigeria, climate change will lead to increase in annual rainfall in some areas, and a decrease in others; both temperature and rainfall extremes are predicted to increase, but with a degree of certainty for rainfall events (BNRCC 2011). Furthermore, simulation using models have predicted that temperature will be higher by 1–2 degrees in 2056-2065 with the extreme north having the highest values. This will be more evident in December to February, whereby temperatures in the north central part of Nigeria will increase by up to 3.5°C. Additionally, in 2020 - 2050, 41-53% of Nigeria is expected to be wetter, while 20-35%t will be stable and 10-14 % will be drier, and for the remaining 2 – 25 %, precipitation projections are highly uncertain (Cervigni, 2013).

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OKHIMAMHE, A. A. (2016). **INTEGRATING CLIMATE CHANGE ADAPTATION STRATEGIES INTO URBAN DESIGNS: A MUST FOR TODAY'S BUILT ENVIRONMENT PROFESSIONAL** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

With this in mind, two case studies, Minna and Abuja are discussed. Both cities are located in the north central Nigeria that is projected to experience an increase of 3.5°C by 2065. While Minna is far less cosmopolitan than Abuja, the town is known for its consistently high temperature during the dry season. It is recommended that built environment professionals should become more creative and climate savvy in adapting both existing and new buildings to climate change by, among others, enhancing poor quality housing through structural retrofitting, interventions that reduce risks and non-structural interventions; paying attention to buildings that provide protection from hot days; upgrading homes with poor ventilation and low thermal mass. Of course, it is expected that challenges will be encountered due to the range of actors in the housing sector, the myriad connections to other sectors and the need to promote mitigation and adaptation, as well as development goals, and these point to the importance of well-coordinated strategies that can support resilience (Maller and Strengers, 2011). The grave predictions for the future underscore the fact that efforts must be made to overcome these challenges, and the professionals must lead the way.

EVOLVING AN EFFECTIVE RESEARCH AND INNOVATION SYSTEM FOR NATIONAL DEVELOPMENT AND UNITY IN NIGERIA

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The United Nations Development Programme rates Nigeria as a country with low human development index. Out of the 187 countries evaluated, Nigeria with its abundant human and natural resources comes a distance 152nd after poorer countries and even war torn countries like Rwanda, Angola, Pakistan and Myanmar. On a scale of 1, Nigeria has a Human Development Index of 0.504 as compared to a world average of 0.702. The country has a life expectancy from birth of 52.5 as at 2015 as against a world average of 70.8 years. It has 630 deaths per 100,000 live births. About 46% (81.65 million of 177.5 million) of Nigerians are living below the poverty line of $1.25 (N250) per day with an infant mortality rate of 78 per 1000 live births. With regards to health care Nigeria has 4 physicians to 10,000 patients as against a world average of 13.4 per 10,000 patients. The country has one of the worst records of youth unemployment of 23.9% as against the world average of 7.5%. Yet we are one of the top ten countries with regards to annual population growth rates of 2.8%, the highest been 5.9% in Qatar while the world average is 1.1%. Also in regards to perception of wellbeing only 55% and 47 % of Nigerian are satisfied with the quality of education and health care respectively. These absurd development indices are complicated by many negative attitudes like corruption, abuse of power; arrogance, social inequity and blatant injustice which combine to suppress innovation, creativity and motivation in contemporary Nigeria. The nation is making no attempt to solve her problems but waits for solutions to her problems from the Western world. This is the only justification why Nigeria spends 0.2% of its GDP on research and development as against 2.5% of GDP by very high development countries like Europe.

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Nigeria can only reverse these very poor development indices by evolving into a knowledge-based economy and this can only be achieved by creating and sustaining an effective national research, innovation and development system which is proposed in this paper.

Keywords: Research, Innovation, Development, Nigeria.

RESEARCH ETHICS: RESEARCHERS' CONDUCT AND ITS IMPLICATIONS ON RESEARCH PARTICIPANTS

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Every aspect of a research work is governed by some ethical considerations which are usually taken for granted. This paper gives an insight into some of the ethical issues that relate to conducting research, analysing data and reporting the findings. First approval to commence a research must be sought from Research Ethics Committee who will ensure that all requirements are met. Such requirements include proving that participation in the research is voluntary, clear communication of the purpose of the research to the participants, including the interviewees who may be local and uneducated people, getting informed consent and ensuring the anonymity of participants. Other requirements include explanations on how the participants will be selected, disclosure of any potential unintended consequences of the research report and assurance that no harm will come to the participants through the research report. Though all these requirements are geared towards protecting the rights of the participants and ensure independent and unbiased research work, passing the tests can be cumbersome and waste precious time.

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OVERCOMING THE CONSTRAINT OF TIME IN ACADEMIC RESPONSIBILITIES

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A major resource input for an academic is time. It is never available in the required amount; but it is a resource that is available to all at the same quantity; 24 hours daily for the 365 days in the year. But the academic is a multiple role player by his employment; teaching, research and service. Each is a bundle of activities that have no time limit to their conduct; within and outside the official working hours and within and outside the four walls of the institution. With the information technology and with the deepening of this global tool, the content and scope of the responsibilities of an academic are becoming wider and wider almost daily. Time is important to him not only because he wants to satisfactorily undertake these responsibilities but also because there are the demands of distinctiveness, competition; and niche cutting. This paper will explore the range of activities that need the attention of an academic, the constraints to effective discharge of academic responsibilities, the justification for time consciousness, the impacts of poor time planning and interrogate the various ways for time planning.

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Panel Discussion Session: Lessons from Conducting Urbanization Research in Nigeria

Chairperson: Professor Johnson B. Falade (FDI)
Discussants: Dr Kwasi Baffour (UWE), Dr Fanan Ujoh (BSU), Dr Sandra Iria (ICF)

This panel will discuss valuable lessons and experiences of conducting researches on urban issues in Nigeria under the *Urbanisation Research Nigeria (URN)* programme.

URN is a four-year (2013-2017) urbanisation research programme funded by UK Department for International Development (DFID). URN is implemented by the London-based unit of the International Development division of ICF International, which specialises in carrying out urban sector projects in sub-Saharan Africa.

URN works with urban studies researchers in Nigeria and the UK, with institutions in government, the community and business that are directly involved in urban development, and with other international researchers, including the Foundation for Development and Environmental Initiatives (FDI), Ibadan, the Development Planning Unit at University College London (UCL), the Department of Urban and Regional Planning at Benue State University (BSU), Makurdi, and the Department of Architecture and the Built Environment at the University of the West of England (UWE), Bristol – as well as engaging the services of other researchers from other Nigerian and international universities.

URN uses four themes to frame the research:

- Theme A: Urban change processes – developing a better understanding of the urbanisation process
- Theme B: Urban economic development – examining Nigeria's diverse urban economies and the opportunities they provide
- Theme C: Well-being of urban citizens – exploring the material, relational and subjective dimensions of well-being
- Theme D: Urban land, planning, and governance – uncovering the processes of urban development and city building.

The research programme was designed to address key social, economic and political concerns in the urban sector in Nigeria.

In the first six months of the programme in 2013-14, URN undertook a scoping review of urbanisation trends in Nigeria, held two events in Abuja to discuss and receive guidance on research proposals developed under the URN themes, and developed the design framework and plan for the urbanisation research programme.

URN then completed reports on each of the four research themes which now serve as a "baseline" for the more intensive research projects in Years 2, 3 and 4. These reports are available on the URN website: http://urn.icfwebservices.com

Examples of research, that this panel will discuss, are rural-urban linkages issues in the Benue River basin, such as population mobility, transportation networks and social interrelationships; the significant effects of increasing urbanisation and climate change on emerging urban health needs; and the planning and governance of informal urban developments in Enugu and Minna. The panel will discuss tangible recommendation strategies for promoting academic research in the country.

SECTION 2: CONFERENCE PAPER

INFRASTRUCTURE DEVELOPMENT AND FINANCING

ASSESSMENT OF REAL ESTATE INVESTMENT ACTIVITIES OF INSURANCE COMPANIES IN NIGERIA

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The purpose of this paper is to provide an insight into the real estate investment activities of insurance companies in Nigeria. The authors attempt to identify the capital engagements in real estate investment by insurance companies. After collecting the aggregate data about insurance companies' financial results for the period 2004 – 2014 and the insurance companies' financial involvement in real estate for period 2004 – 2014, the authors analyzed the relationship between the two. This is meant to assess whether the insurance companies complied with the National Housing Fund act of 1992 which mandate all insurance companies to invest minimum of 20 percent non-life and minimum 40 percent of life funds in real estate development. The analysis revealed some negative correlations; an incompliance of the insurance companies to the National Housing Fund act. If this is true, the conclusion should be accepted with caution. It is therefore recommended that management of insurance companies and government should sit and find a solution to the problems identified that hinder the insurance companies from meet up with National Housing Fund Policies. These Problems are insurance policy, long recoupment period, inflations affecting building materials leading to cash flow problem, falling premium revenue, tenancy risk and unawareness of the companies operation.

Keywords: Investment, Insurance, Revenue, Risk, Housing

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EXAMINATION OF HOUSING INVESTMENT PERFORMANCE IN ABUJA, NIGERIA

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Housing investment performance is an examination of total return from an invested capital in real estate market, vis-à-vis an associated market risk. The incessant failure of real estate investment is attributed to the lack of feasibility and viability forecast on future of investment and poor analysis of past and present market situations. The objective of the paper is to examine the performance of housing investment return with a view to determining the quantum of risk to be taken to earn an expected return and to establish the most secured investment market. The literature has revealed that the failure of most investment is due to poor analysis of economic and market conditions. The research concentrates on the analysis of Abuja property investment market with view to examining the returns from different real estate sub-markets. The research employed descriptive analysis (standard deviation, coefficient of variation and sharpe ratio) and ANOVA to analyze the data collected through systematic method of sampling. The result of analysis of variance showed a statistically significant difference in returns on investment, at p-value of 0.00013 less than 0.05 level of significant. The results of residential investment performance across three locations in Abuja showed high volatility in Maitama and Wuse residential submarkets at 4.81% and 4.04% respectively, and Gwarinpa market is less volatile at 1.41%. Gwarinpa market showed a stable return on the investment at 6.7% and 6.6% for arithmetic and geometric means respectively. Therefore the research concludes that Gwarinpa residential market exhibited steady and stable return on the basis of average returns, less volatile and performed better on the basis of risk-to-reward ratio than any other submarket at 0.21. Maitama submarket is described as the most risky and volatile submarket at 4.8% standard deviation.

Keywords: residential, investment performance, sharpe ratio

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INFRASTRUCTURE DEVELOPMENT AND FINANCING FOR SUSTAINABLE HOUSING DELIVERY IN NIGERIA: A REVIEW

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The success of any sustainable housing delivery system depends on a wide range of factors among which are availability and accessibility to land, environmental security, safety, community interaction, availability of adequate infrastructure services and mortgage finance. Affordable Housing provision has remained elusive to an average Nigerian, in spite of several programmes put in place by various government of the country, past and present. The paper aimed to examine the impact of adequate infrastructure provision, availability and accessibility of mortgage finance towards sustainable housing delivery system in Nigeria. Methodology of study included review of secondary data. The secondary data involved are research data, official documents and other relevant secondary data obtained from existing literature, books and published journals articles. The paper observed that the key challenge of accessing housing finance in Nigeria is affordability challenge especially by the low-income urban dwellers. The affordability parameters inherent in the mortgage instrument limit access by the low-income population. These parameters include 20% - 30% equity contribution, maximum tenures of only 10-15 years, high interest rate of 22% and the non-availability of long-term funding for housing development which compels builders of residential accommodation to recover their capital within the shortest possible time. Findings revealed that sustainable housing delivery in Nigeria has been hampered by inadequate financing, inadequate infrastructure provisions which has resulted in many people living in substandard housing, unhealthy environment with its attendant social inequality, low standard of living, and poor health especially as it affects the low-income urban dwellers. Also, Changes in climate will stress current infrastructure, exacerbating existing weaknesses and forcing major programmes of renewal and replacement, well-supported with finance and technology and implemented by skilled workforces. This paper opined that infrastructure development through adequate mortgage financing will stimulate sustainable housing delivery process in Nigeria. Finally, it recommended massive investment in infrastructure development by Government at all levels to reduce cost of housing construction; Review of the Land Use Act; enhancing the accessibility of Nigerians to housing finance by relaxing the conditions attached for getting the housing funds through the NHTF and integrating climate change considerations into contracts on infrastructure

Keywords: Infrastructure, financing, sustainable development, housing, climate change.

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MODELING THE EFFECT OF CHANGES IN THE PRICE OF CONSTRUCTION MATERIALS ON THE RATE OF DEV ELOPMENT IN ABUJA

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ABSTRACT
The ever increasing cost of building construction materials in Nigeria has been a major sour ce of concern to all the stakeholders in industry because of its overarching effects on infrast ructure development. Globally, persistent rise in the price of materials has been reported to have consequential effects on sustainable development. This study, therefore, determines to analyse the effects of an increase in the prices of construction materials on the rate of devel opment in Abuja. In order to achieve this, data were sourced qualitatively and quantitatively from Abuja using archival data, personal observations and Geospatial techniques which inv olve the use of Remote Sensing and Geographical Information System (GIS) to determine t he rate of development over the years. Some selected building materials were examined and compared with the rate of development. The growth rate for the period of study was based o n built-up area per square meter. The data were analysed using both descriptive and inferent ial statistical analysis, to determine the relationship between the increases in prices of select ed materials on the rate of development. The result of the research has shown that changes i n the prices of building materials have effect on the rate of development explaining an avera ge 85% in the variation explained by the models. The changes in the built-up area and veget ation between 1990 and 2014 was found to be significantly high. The research has indicated that a reduction in the prices of building materials will lead to a significant reduction in the cost of housing projects in order to improve housing affordability and sustainability. The stu dy is expected to contribute largely to currently discuss and vision of Nigeria in achieving s ustainable urban development. It will also be of benefit to all the stakeholders in understand ing the essence of achieving sustainable growth through an effective price control mechanis m.

Keywords: Building materials, sustainable development and rate of development

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WORK-LIFE BALANCE AMONG WOMEN CONSTRUCTION WORKERS: A CONCEPTUAL APPROACH

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Work life balance is a 'fit' between multiple responsibilities in an individual's life both at home and workplace. The concept of Work-Life balance is not entirely new in the construction lexicon, it has advanced over time. The idea of work-life balance developed from the fact that an individual have varying roles which often places mutually exclusive demands on one another; for instance, wife versus worker. However, striking a balance between work and personal life among female construction employees has been a herculean task confronted by women due to the nature of roles being played at home and the overflow of personal life over work life. This paper presents a literature review of past studies relating to work-life balance with specific focus on the construction industry. An extensive review of existing literature assist in identifying constructs such as work life balance of women employees, organisational commitment, organisational strategies for improving work-life balance and their influence on organisational performance. Findings from the literature on the links between these constructs provided the basis for the development of a conceptual approach used in demonstrating the hypothesized interaction among the constructs and their influence on organisational performance. The developed conceptual model forms the basis for further empirical study aimed at quantitatively demonstrating the nature of relationship that exists among the constructs and their joint influence on organisational performance in the context of the Nigerian construction industry.

Keywords: Work-life balance, women workers, construction industry, organisational performance

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BRIDGING COMMUNICATION GAP AT CONSTRUCTION SITES IN ABUJA: THE PIDGIN ENGLISH ADVANTAGE

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Communication among different cultures is very vital in workplace and in the society as a whole. Negative occurrences of misunderstanding due to breakdown in communication often occur on construction sites with the attendant consequences on productivity and well-being of the site workers. Hence, the study assessed communication among diverse workers on construction sites in Abuja through the use of unobstructed observation in ten selected sites in Abuja; In addition to this, ten managers/supervisors were interviewed. The study showed that interactions among the workers basically were in English and Pidgin English. Furthermore the study revealed that although 71% of the selected construction firms operate formal organisational structure which entails standard communication in English Language, but in reality, there are informal interactions among the diverse workers within the organisations which give room for informal mode of communication. Despite this unanimous communication in Pidgin English majority of the Hausas could not communicate with other tribes in either English or Pidgin English except with the assistance of an interpreter. Needful to say that the communication bridge among the diverse tribes is not sufficient since majority of the Hausas are yet to assimilate into the Pidgin English mode of communication culture. This therefore call for concern from construction firms to create awareness and also ensure proper training of the affected tribes on the use of Pidgin English as a means of effective communication among diverse workforce on construction sites in Abuja.

KEY WORDS: Culture, Ethnicity, Communication, Pidgin English, Construction firms.

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THE CHALLENGES OF COST MANAGEMENT OF INFRASTRUCTURE DEVELOPMENT IN NIGERIA

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The failures recorded in the infrastructure projects in Nigeria were as a result of the poor cost management right from the inception of the projects. This had led to the exploration of the major causes of poor cost management of infrastructure projects and the possible mitigation measures were proposed to improve the poor cost management of infrastructure projects. A questionnaire survey approach was adopted, because of the nature and the type of data required. A total of 150 numbers of questionnaires were distributed to Engineers, Quantity surveyors, Project Managers, Construction Managers, Contractors, Consultant and Stakeholders in the construction industry. In addition, the respondents were also requested to propose and classify mitigation measures for poor cost management that goes with any of implementation strategies. 15 measures were proposed in line with the implementation strategies and arranged using a likert scale format for the respondents to make choice. The descriptive analysis was used to analyse the data obtained from the responses of the respondents. The results obtained from the analysis shows the followings as the major causes of poor cost management of infrastructure projects delivery. These are improper planning and inadequate engagement of quantity surveyors in infrastructure project delivery right from the inception stage, wrong method of estimation, lack of proper monitoring by cost managers and cost engineers, slow decision making, cash-flow problems during construction, etc. The other results shows that among these 15 measures, five measures are classified as pro-active strategy and four measures are classified as organizational strategy. However, other six measures are classified as fluid measures which can be adopted in more than one strategy. Therefore the paper recommends that the management of construction industries should apply the strategies mentioned above to improve the poor cost management of infrastructure projects, since the infrastructure projects are keys to accomplish the country's dream of vision 20:2020.

Keywords: Cost management, infrastructure project, implementation strategy, mitigation measures.

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EXAMINATION OF FACTORS AFFECTING ACCURACY OF VALUATION FOR SECURED LENDING IN ABUJA, NIGERIA

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Collateralized property interest is a major requirement in financial lending. There already exists a consensus among the academia, the professionals, and the judiciary, that inaccuracy in valuation is inevitable. Also the various regulatory bodies of real estate practice including the Royal Institution of Chartered Surveyors, the International Valuation Standards and even the Nigerian Institution of Estate Surveyors and Valuers, have asserted that the valuer and most informed users of valuation, particularly financial institutions recognize that there will be a degree of uncertainty attached to valuation figures. This study therefore seeks to examine those factors that may affect the accuracy of valuation for secured lending in a developing economy like Nigeria and specifically in Abuja the capital city and one of the leading economic regions of the country; the factors that could undermine the objectivity and possibly influence the opinion of value from the lender and borrower's perspectives. The paper is basically a literature work based on non-empirical study and review of previous studies by eminent academics; random interviews with some officials of banks in Abuja were conducted but no questionnaire was administered. Summary of factors include professional knowledge and expertise, clients' influence, country's economic and political situations and valuation standards are some of the factors affecting the accuracy of valuation for secured lending. It is recommended that there should be continuous specific training in valuation, industry-academia partnerships in estate surveying and valuation and the use, enforcement and continuous review of Valuation Standards.

Keywords: Secured lending, Valuation, Accuracy, Influencing factors

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CHARLES-AFOLABI Christianah Yetunde & OLATUNJI Ayodele. (2016). **EXAMINATION OF FACTORS AFFECTING ACCURACY OF VALUATION FOR SECURED LENDING IN ABUJA, NIGERIA**
Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

ARBITRATION AS AN ALTERNATIVE DISPUTE RESOLUTION IN REAL ESTATE

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Litigation is one of the methods aggrieved people can explore to seek redress for a wrong c ommitted against them. Though with the passage of time, the litigation system has been enc umbered with a lot of cases that will not be resolved anytime soon. The truth of it is that the Litigation system is becoming complicated, with regards to costs and time spent in resolvin g cases. Disputes arising from real estate are not exempted from these complications. Hence , the examination of arbitration as an alternative dispute resolution in real estate. The aim of this paper is to identify areas in real estate where arbitration can be and has been applicable in resolving disputes. The study is a theoretical research that used secondary sources of data collection such as journals and text books. The study found that there is need for profession als in the industry (real estate to be precise) to embrace this ADR. The study concludes that if arbitration is properly fine-tuned to fit various needs in real estate it would be a valuable t ool for resolving whatsoever disputes that can arise there in.

Keywords: dispute, litigation, arbitration, real estate dispute.

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FINANCIAL RISK ASSOCIATED WITH HOUSING ESTATE PROJECT DEVELOPMENT

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Construction industry is a highly risk prone industry, with complex and dynamic project environments creating an atmosphere of high uncertainty. Effective risk management can bring greater rewards to project performance by enhancing productivity. The objectives of this paper is to identify the major financial risks associated with housing development projects and to appraise the practical measures that various construction industry do take to manage those risks. Forty structured questionnaire was self-administered to private housing estate developers in Abuja to examine the current trend of financial risk management implementation. The preference of the housing estate developers were collated and analysed using descriptive analysis technique on SPSS. The results from the analyse data indicate that inflation, excessive approval procedure due to bureaucratic bottlenecks in government departments and inadequate programme scheduling were found to be the major financial risks. Thus this paper suggests rationalisation of housing estate project approval procedures to enhance housing delivery projects and to eliminate construction risk.

Keywords: construction industry, financial risk, risk, risk management, risk management technique,

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FACTORS AFFECTING PROJECT PLANNING EFFORTS IN AKWA-IBOM STATE

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All construction projects are unique and the amount of effort invested into planning activities will depend on the nature or the character of that project; as no two construction projects are identical. This prompted an investigation to evaluate the factors affecting the efforts invested into project planning activities at the pre-contract stage in Akwa Ibom state. The aim of the study is to evaluate the factors affecting efforts invested in project planning amongst selected consultants. A field survey involving 92 project consultants was adopted to achieve this objective. Data was collected using structured questionnaires and analysed using mean and relative importance index. It was discovered that the demands of the client, the clients budget and the construction method to be adopted ranked highest amongst others as having more impact on the measure of efforts invested in planning and indirectly on the performance of the construction Projects. The study suggests that all stakeholders collaborate more frequently by building stronger partnerships and aligning all actors as an integrated supply chain..

Keywords: Project lifecycle, Nigeria, Project planning, Pre-contract planning and planning effort.

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Olubajo .O. Oluseun *[1], Godwin Idoro*[2] and R. A. Jimoh *[3] (2016). **FACTORS AFFECTING PROJECT PLANNING EFFORTS IN AKWA-IBOM STATE** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

ASSESSMENT OF SPONTANEOUS PHYSICAL HOUSING CHANGES IN URBAN CENTRES OF SOUTH WEST NIGERIA

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The paper assesses the spontaneous provision of unplanned physical modifications within the overall residential housing areas in south west, Nigeria and how this affects overall primary function of housing quality in the zone. The study employed descriptive survey using observation schedule, questionnaire and hypothesis testing. The study distributed 784 questionnaires among three (3) urban centres and 557 questionnaires were returned representing 71%. The findings show that spontaneous physical housing changes occurred in all the houses-types and the transformation is purposely for economic pursuit. The paper suggests a transformation policy frame work to regulate the urban housing transformation activities in south west Nigeria.

Keywords: satisfactory, spontaneous, housing, transformation, policy.

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ROUTE RE-ALIGNMENT SURVEY FOR COST EFFECTIVE CONSTRUCTION OF A CONNECTING BRIDGE OVER SULEJA-DAM

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Before the construction of Suleja dam in 1993, people and goods were conveyed / transported freely through the old road because the small river separating the adjoining communities (Ija, sabo bwari, ija kuchiko and ija koro) had a small bridge that accommodated vehicular and other means of transportation. However, because of the construction of the dam, the communities once connected are now separated in their economic and social interaction. In view of this; this research was carried out with the aim of realigning the old road to accommodate a shorter and cost effective bridge over the dam. Differential Global Positioning System (DGPS) receivers were used to set-out the new alignment while an Automatic level was used to transfer height from the Benchmark to the lake. Eco Map 50s was used to carry out the strip sounding over the proposed bridge route to determine the water depth. A total length of 2.919km was obtained from the proposed realignment as against a distance of 3.038km of the old alignment. As a result, a proposed bridge length of about 514m was achieved as against the 740m of the old alignment. AutoCAD 2010 and Carlson were used to plot the alignment, as well as the longitudinal profile and length calculation. In addition Layer stacking of the existing alignment and new alignment of the area on satellite imagery of the site was also carried-out in order to depict the differences between the existing road and the proposed realignment.

Keywords: Communities, Bridge, Route Realignment and transportation

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BUILDING A MODERN LAND ADMINISTRATION SYSTEM IN NIGERIA

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Land administration is a significant framework for the management of any nation's pool of resources and has remained one of the most chatted discourses among urban issues in many developing countries. This paper examines the issues in land administration in Nigeria and other developing countries, looking at the various administrative and legal frameworks in place for an efficient land delivery system. The land administration system in Nigeria is plaque by challenges spanning from policy, institutional and legal frameworks to technical and operational issues which have direct impact on implementation. These challenges emanated from some of the import ideologies that adjustments could not be made upon. The study recommends the reform of policies and the creation of a local integrated land administration system model (LAS) that will accommodate our country peculiarities. Also the development and sustenance of an ICT based professionals and infrastructure that will enhance efficiency in the land information system.

Keywords: Land Administration, Institutional Framework, efficiency, Policy,

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EVALUATION OF SITE PROGRESS RECORDS FOR EFFECTIVE PROJECT MANAGEMENT IN ABUJA, NIGERIA

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Progress records such as monthly progress report, or site diaries are important tools for tracking construction progress and ensuring full compliance of the building contractors to statutory standards. Accuracy of these records is also important for quality assurance avoidance of delay in the construction process, finance, preparation, analyzing and resolution of claims in the event of failure or breach of contract. Literature reviewed identified a range of problems with respect to the quality, accessibility, legibility, continuity and consistency of these records. The objectives of this study was to identify the uses of site progress records, the importance of site progress records in building construction, and the problems encountered when compiling he records. Research methodology involved the use of structured questionnaire and site visitation to the various building construction site within the study area. Analysis of data involved the use of description statistics. Findings indicated that among all the parameters surveyed in the application of site progress records for effective project management, the most outstanding ones are 'effective site management and supervision', 'proper project planning and scheduling' and use up to date technology utilization. A possible explanation for this is that the quality of the construction work carried out will turn out to be good and it will also aide quick time delivery of the construction process. It was concluded that the necessity in keeping site progress records for effective project management are considered to be useful for construction project execution. It was recommended that resources should be provided for making and keeping of back-up of all records generated in the course of project management and the use of statutorily registered professionals for public projects should be advocated.

Keywords: Construction Process, Effective Construction Project management; Site Progress Records

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Bajere, Paul Abayomi and Mohammed, Nasiru Abubakar (2016). **EVALUATION OF SITE PROGRESS RECORDS FOR EFFECTIVE PROJECT MANAGEMENT IN ABUJA, NIGERIA** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

CHALLENGES OF PROPERTY RATING ASSESSMENT IN KARU LOCAL GOVERNMENT AREA OF NASARAWA STATE

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The Local Government Reform of 1975 strengthens the fact that Local Government as the third tier of Government, which directly impacts the people should have a concrete source of generating revenue independent of the central allocation by exploring property rating which is a good source of generating income for the Local Government. This form of tax is known to generate revenue to the government for the provision of the necessary infrastructures. The non-passing of "the Karu Local Government Tenement Rate Law" into Law by the State House of Assembly has limited the power of the rating authority to prosecute defaulters, lack of political will and inadequate records on properties just to mention a few. The research explored both primary and secondary which were synthesised for the purpose of underpinning the challenges of property rating assessment in Karu area of Nassarawa State. Findings have revealed that lack of accessibility resulting from bad road networking in the area, non-participation of professionals in carrying out the assessment exercise has been identified to be part of the problems working against a successful property assessment. This paper aims at investigating other challenges associated with assessment of properties for rating purpose within the Karu Local Government area by the use of questionnaires which would be administered within the subject area with the aim of identifying the problems of rating assessment and making suggestions on how to improve the income of the local government through rating assessment.

Key words: Tenement, Property, Government, Law, Authority

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DISTRIBUTION PATTERNS OF FEDERAL AND STATE ROAD NETWORK IN IMO STATE (2000 – 2014)

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People in the world today experience constant pressure and these pressures are products of cooperate forces which are increase in world population, technological advancement, and explosion of knowledge. Meanwhile, these developments have the tendency to get worse than better; they give a practical working assumption as to what future inhabitants might face or look like in respect to pressure. Although these developments each have different manifestation, they share similar effects. Specifically, they generally contribute to the occurrence of mental fatigue, which can make humans to be less healthy, less tolerant, and less effective. The above-mentioned problems are common with the learning environment which faculty buildings falls under. Contact with natural environment can perform a core role in decreasing this disastrous effect. This research focuses on the impact caused by the absence and inadequacy of landscape elements; using faculty buildings of tertiary institutions in Kogi State as area of the study. Data was collected using observation schedule and questionnaires of the forty three approved faculty buildings in the eight existing tertiary institutions. From the analysed data, it was observed that 88% of the faculty buildings were not properly landscaped. The research further seek to know how comfortable are the users in these environments, and it was discovered that a total of 86% of the users were not comfortable due to the lack of basic landscape elements that were not adapted, thereby reducing the hours willing to spend in the environment. Data showed that over 80% of users agreed that the adaptation of basic landscape elements will help increase productivity and also agree to spend more time leaning if the environment is well landscape. The research provides workable ways of improving the learning environment by adapting the relevant landscape elements, by the use of various plants that depict a particular function, activities, and feeling of a space. Spaces for indoor plants should be design to accommodate them, and architects should design landscape layouts in every faculty building design, putting into consideration their maintenance technique.

Keywords: knowledge explosion, mental fatigue, natural environment, landscape elements, maintenance.

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SUSTAINABLE PRACTICE THEORIES

ADAPTATION AND FLEXIBILITY OF SPACE IN SUSTAINABLE HOSPITAL DESIGN IN NIGER STATE

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The ability to improve the total quality of life now and for the future, in a manner that shaping the environment in relation to its users ensures sustainability. Hence sustainable buildings are to provide a comfortable environment that enriches nature and human activities. To adapt a building, the floor shape and room volume should have the capacity to accommodate the activities of its initial design while allowing multi-anticipated user requirement. The capacity of a building to absorb future functional change, displacement and increase in size, enables a smooth operation of activities. Hospital buildings are a hub of treatment and care synonymous with unpredictable changes arising from demographic displacements or improvements in technology. A major problem with spaces in hospitals in Niger state is their functional rigidity which most times limit their capacity to meet the changing demands of biomedical care. The flexibility of spaces is the ability of such spaces to adapt to multiple use and multiple functions. Therefore, the paper examines the levels to which spaces in hospital buildings in Niger state can meet the functional requirements of multiple changes to meet the changing dynamics of biomedical care. The method of research is descriptive survey. Thus, this will involve direct observation and structured interview guide for the sample population. This paper will recommend the use of movable partitions, floor, and ceiling types to increase the level to which spaces can adapt to changing demands and yet meet the functional requirements of its intended use.

Keywords: adaptation, change, flexibility, hospital, space, sustainability.

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COMPARATIVE ANALYSIS OF LOW-TECH SUSTAINABLE HOUSING PROJECTS IN ABUJA AND ENVIRONS

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Housing, which is a major index of sustainable development, remains a major challenge in many developing countries. Sustainable housing delivery in Nigeria demands addressing th e global challenge of housing production within the carrying capacity of supporting ecosyst ems, and the local challenge of low-cost or affordability. The solution lies perhaps in the in novative use of low-tech solutions using sustainable building materials and technology. Thi s is because materials are responsible for about 70 percent of the cost of buildings. These m aterials and technologies must however meet the requirements of sustainability. It is in this l ight that case studies of three housing projects in Abuja, Nigeria and environs were conduct ed using visual survey and descriptive analysis. The evaluation was based on established re quirements for sustainable building materials. The result shows that one of the projects larg ely met the requirements for sustainable building materials and technology, while the other t wo could be rated as partially sustainable. Though all the case were classified as low-tech, m aterials such as steel and reinforced concrete which do not fall into this class were used in v arying degrees thereby reducing their sustainability. Based on this, it is recommended that e fforts at achieving low-tech solutions for sustainable housing in Nigeria should focus innov ative use of local and readily available material and avoid or minimise the temptation to aug ment with high-tech materials and methods.

Keywords: Building materials, embodied energy, low-tech, sustainability, sustainable housing

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DESIGN CONSIDERATION FOR ECOLOGICAL AND GREEN DESIGN IN SHOPPING CENTRES IN MINNA NIGER STATE, NIGERIA

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Growing census in human population has it that the infrastructure and cities ecology are both at risk as a result of the impacts of climate change experienced globally. Buildings are found to be both, one of the biggest consumer of energy and producer of greenhouse gases. According to the National Institute of Building Sciences(USA), buildings generate 35 percent of the carbon dioxide (the primary greenhouse gas associated with climate change), 49 percent of the sulphur dioxide, and 25 percent of the nitrogen oxide found in the air. These activities in the long run affect the environment in terms of urban ventilation and cooling, urban drainage and flood risk and water resources and conservation. The aim of this study is to identify and discuss the ecological and green design considerations to be implemented when designing shopping facilities to achieve more environmental friendly buildings. This research collated data from a sampled population of existing shopping complexes in Minna (the study area) based on zoning and volume of commercial activities in these buildings. This was done by using observation schedule to assess the effects of energy emission and conservation, ventilation and cooling, water conservation, power source, building orientation, outdoor finishing material and spaces (including air quality and biodiversity) and how all these parameters affects the environment. This is with the view to create structures that are environmentally responsible and resource efficient to reduce the impact on human health and the natural environment. This proffered solution is not short termed but rather one which provides built environment that is self-sustaining and efficient.

KEYWORD: Ecological design, Sustainability, Water conservation, Cooling and Ventilation, Building Orientation, Power source, finishing material, Roof type

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GREEN ARCHITECTURE: THE PERCEPTION OF NIGERIAN ARCHITECTS

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Human needs in the 21st century are ever increasing with limited resources to meet them. The challenges of insufficient energy, shortage of water, poor health and health facilities, pollution, climate change and human inability to sustain built environment are becoming enormous. Developed countries are adopting new architectural practices such as green design or sustainable design to combat such challenges. Green design or sustainable design imply developing more environmentally benign products and processes that would lead to energy efficiency, water efficiency, waste reduction, building operation, construction, maintenance, occupant healthy and productivity, stormwater and flood management, climate and sustainable built environment. Therefore, the purpose of this paper is to examine the perception of Nigerian architects on green design. Other specific objective of the study will be to examine the level of awareness and practice of green architecture in Nigeria. The survey research will be adopted for the study. Primary data will be collected through the use of structured questionnaires. The questionnaire will be distributed to architects in Kaduna state. Descriptive statistics and t-test will be used to present and analyze collected data using SPSS v16. The study will conclude by making recommendations based on the findings of the study.

Key words: Built environment, climate change, green design, sustainable design

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INTEGRATION OF KEY DESIGN ELEMENTS FOR PLAY-LEARNING ENVIRONMENT IN ELEMENTARY SCHOOLS IN MINNA, NIGERIA

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ABSTRACT
In an era of climate change and a time when pupils especially those in elementary schools are confined indoor to learning. Attempt to entice and encourage children and their teachers to spend more time in a well structured, child-centred green designed school grounds is timely and cannot be overemphasized. Creating an Outdoor learning and play environment is an initiative that would incorporate green design principles targeted at meeting children's developmental needs. Children's developmental needs are cognitive, physical , social and emotional. This paper assessed the physical outdoor spaces and natural elements in elementary schools with a view to integrating these elements in elementary schools in Minna, Niger state . The research was carried out by the use of a structured observation schedule and questionnaires. Data collected were analyzed using descriptive statistical tools such as mean, percentages and averages. The findings revealed that only 25% of the playgrounds of primary schools in Minna have above average fixed components. It also showed that no provisions were made for experimental, individual, gathering and ecological spaces. The results generated were shown in tables. The paper recommended that play-learning environment be integrated in elementary schools in Minna.

keywords: Climate change, developmental needs , elementary schools, green designed, , space.

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AKPAMA, D. S & AYUBA, P (2016). **INTEGRATION OF KEY DESIGN ELEMENTS FOR PLAY-LEARNING ENVIRONMENT IN ELEMENTARY SCHOOLS IN MINNA, NIGERIA.** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

MITIGATING CLIMATE CHANGE THROUGH GREEN ARCHITECTURE

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Climate change is real and felt globally. Climatic factors such as intense solar radiation, high humidity and condensation, dust and sandstorms and flood affects the comfort of man and safety of built environment. Most of the climatic changes are due to human activities in the environment, particularly the built environment. These suggest that human activities and physical constituents of built environment interact with other climate drivers. These prompt the need for response. And response to climate change falls into two phases- mitigating and adaptation. Therefore, this paper discusses how climate change can be mitigated through green architecture in Nigeria. In this light, the paper will be a conceptual paper. The library research method was used in this study to gather secondary data from textbooks, articles and journals to develop a conceptual framework how green architectural practices can be used to mitigate climate change in order to sustain built environment in Nigeria. This paper adopts the U.S. Green Building Council (USGBC) (2015) principles of green building and sustainable site design. It highlights climatic changes and their effect in Nigeria. It further discusses the concept and principles of green architecture. The study concludes that Nigerian built environment is vulnerable to the impact of climate change. Therefore, there is need for architects, building engineers and clients to promote and adopt green architectural practices in order to mitigate the effect of climate change for sustainable environment.

Key words: Built environment, climate change, climatic factors, green architecture

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UNDERSTANDING THE ROLE THE ARCHITECT PLAYS IN ATTAINING SUSTAINABLE DESIGN AND CONSTRUCTION

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To comprehend the part of the architect in achieving sustainable design and construction, we must first realise that the architect is "the first developer" in the building and construction industry. Initially the Architect, as the originator controlled the outline purpose and regulated the work of the developers. As building projects turned out to be more complex, building experts in civil engineering and other related fields became secondary designers to the Architect. Today the Architect is the said to be the focal contact among other professionals in the building industry working towards the completion of a project. The paper starts by answering the question of what Architecture is. It discusses the job description of the architect and his role in a construction site. The paper also highlights sustainability factors and principles as it relates to architecture, while also discussing principles of sustainable building design. The paper highlights the various roles of the Architect in attaining sustainable design and construction in the built environment. In conclusion, the paper recommends the integration of the concept of sustainability at the training stage of Architects.

Keywords: Architect, Construction, Design, Environment, Sustainability

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USE OF OPEN SPACES IN IMPROVING OFFICE BUILDING SUSTAINABILITY IN TERTIARY INSTITUTIONS

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The increase in globalization of the marketplace, rising economic competition, population growth and environmental challenges ranging from climate change to air pollution and flooding to rising energy costs, sustainability has become a key requirement in the design of office buildings regardless of their location. The demand for office buildings is high in many tertiary institutions and the use of open spaces have not been fully utilised in the design of building in them. The challenges of climate change have made it evident that courtyards alone should not be seen as the only open space in office buildings for responding to climate issues. The growing demand for energy efficient buildings requires a greater responsibility of architects today and in the future to rise up to the call. The aim of the study is to examine the utilization of open spaces in office building of tertiary institutions with the view to determine how they can be used to improve the sustainability of office buildings. The research method adopted for the study was mixed method. Data was obtained using an observation schedule and a questionnaire. The data was cross tabulated with SPSS 17 and using descriptive statistic. The research was able to determine the relationship among variable and the frequency of occurrence of others. Result obtained presented in chats and plates. The study reveals that the traditional open space in tertiary institution buildings are courtyards and they are not designed to counter the effect of climate change. The paper concludes by recommending that smaller open spaces can be fused into office designs to improve utilization and cater for climate change problems.

Keywords: Courtyard, Energy efficiency, Office building, Open spaces, Sustainability

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***OQUA, Idowu Titilope[1] & ADEDAYO, Olatunde Folaranmi[1]** (2016). **USE OF OPEN SPACES IN IMPROVING OFFICE BUILDING SUSTAINABILITY IN TERTIARY INSTITUTIONS** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

ASSESSMENT OF THE IMPACT OF PARTITION MATERIALS ON FLEXIBILITY OF SPACES IN SELECTED COMMERCIAL OFFICES IN MINNA

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The new trend of knowledge-work for which commercial office spaces are meant, requires that staff must have ease for collaboration and integration. From research, this is because improvement in productivity is achieved when collaboration takes place. Space flexibility is amongst many factors that prompt collaboration. The effect of this means the choice of wall partition materials is also of concern toward achieving space flexibility for collaboration. The commercial offices of Minna may or may not have adopted the requirements for collaboration when compared to required standards for collaborative spaces. Therefore, this research seeks to examine how the commercial offices in Minna have fared when they are viewed from the perspective of that premise. This paper have examined selected commercial offices in Minna and how the choice of materials for partitioning the indoor spaces have impacted flexibility of spaces. Observation schedules were used to source data and later analysed. The results from the tables presented showed that five out of the six offices visited have open plan office type which the research showed as the best plan layout for flexibility of the office spaces. Timber, Glass, plastic, and aluminium were the commonly used partition materials. However out of the five offices, only four have internal wall partition materials that are flexible and allow for flexibility in the event of change of use. Recommendations are that, in NIPOST plaza, offices should be remodelled to have flexible interior partition materials for adaptability to occur. Also, collaborative spaces must be adopted in future commercial office as a proven means of improving productivity.

Key words: knowledge work, collaboration, integration, productivity, space flexibility, commercial office, wall partition, remodel, adaptability

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Mohammed B.A and Anunobi A.I. (2016). **ASSESSMENT OF THE IMPACT OF PARTITION MATERIALS ON FLEXIBILITY OF SPACES IN SELECTED COMMERCIAL OFFICES IN MINNA** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

GREEN BUILDING CONSTRUCTION IN ABUJA: THE MATTERS ARISING

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Recent trend in the international construction sector has witnessed the rise of green buildings in developing and developed countries. Although the concept and implementation of green buildings is on the rise worldwide, this is not the case in Nigeria hence, this paper assessed project stakeholders' level of awareness and extent of use of green concept in the Nigerian construction industry with specific reference to Abuja. The study adopted combination of physical observation and structured interview methods to elicit information; 3 active sites were visited and 13 interviews were conducted. Findings showed that awareness is not associated with implementation. The participants in the study recognised the benefits inherent in green buildings and affirmed moderate level of familiarity with the concept. To key into this, construction practices must be fully regulated and enforced in line with sustainability agenda in Abuja.

Keywords: Built Environment; Green Building; Nigeria; Stakeholders; Sustainability

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ASSESSMENT OF SUSTAINABLE REAL ESTATE DEVELOPMENT ISSUES IN NIGERIA

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Sustainable development (green building design and construction) can be described as the utilization of environmentally responsible methods of optimizing the efficient use of resources such as energy and water, to maintain a healthy land, water and air quality throughout the building life cycle. Green construction practices have gained wide popularity in many developed countries in the construction of residential and commercial buildings. The story is the opposite in the developing countries. For instance, Nigeria as a country depends mostly on crude oil and electricity for its energy fulfilment. With epileptic supply of electricity, increasing in cost of energy, and the need to improve energy efficiency, there is a need to develop a sustainable and efficient energy system, to meet Nigeria's future energy needs. Study objectives are to: (1) identify constraints limiting involvement of built environment professionals and other built environment professionals in sustainable development practices in Nigeria; (2) determine the respondent's perception of the importance, affordability, and adoptability of sustainable development in Nigeria. (3) access respondent's perception of Nigerian regarding green building attributes, and (4) access respondents perception of Nigerian regarding green building practices. Literature review revealed that technical knowledge such as professional and scientific training on complexities of the construction and operation of intelligent buildings, lack of government support and incentives, and lack of relevant environmental laws and regulations are some of the critical barriers. The sample consisted of 74 respondents randomly selected built environment professionals in Niger State, Nigeria. The analysis involved the use of descriptive statistics. Findings revealed that majority of those surveyed identified, among others that lack of government support and incentives, and lack of funding from public and private housing finance institutions were identified as barriers to sustainable development in Nigeria. Inferences were made to improve awareness education through advocacy and enlightenment programmes and empowering regulatory agencies to enforce and strengthen existing regulations.

Keywords: affordability, green building, sustainable development,

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EVALUATION OF THE EFFECTS OF ABANDONED BUILDINGS ON SUSTAINABLE DEVELOPMENT OF RESIDENTIAL AREAS IN MINNA, NIGER STATE

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The sustainable development of residential building environments entails a residential environment that provides residents better environmental conditions that can be easily maintained. It incorporates environmental protection, economic growth and social equity in planning and organisation of residential areas. This study explores the effects of abandoned buildings in residential areas of Minna, Niger state on sustainable development of the town. It exposes the causes and effects of abandoned buildings on the residential areas of the town. Research methods used for this study include the use of descriptive, qualitative and quantitative methods. A thorough review of literature on building abandonment, the causes and effects on the environment was carried out. Data was collected from selected residential areas in Minna using structured observation schedules and personal interviews with residents of residential areas selected and officials of the Niger state ministry of lands, survey and housing. The data collected were then analysed using SPSS10 and MS Excel 2010 from where tables were developed. The findings indicate that the major cause of abandoned buildings in Minna is poor pre construction planning on the part of the building owners. Building construction project in residential areas in Minna are carried out over an unregulated period of time based on discretion and availability of resources to the owner. During the period of time in which the buildings is under construction, it is left abandoned and mostly becomes an environmental dilemma posing health risk to the residence and also acting as a haven for anti- social activities. Enacting laws that ensures proper pre construction planning in residential areas and the provision of a workable mortgage system in the Niger state will go a long way in dealing with building abandonment.

Keywords: abandoned buildings, building owners, residential areas, sustainable development

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URBAN RESILIENCE AND ENERGY CONSERVATION

ADAPTATION OF PASSIVE COOLING STRATEGIES IN HOSTELS OF TERTIARY INSTITUTIONS, NIGER STATE

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Hostel buildings serve to provide a low cost, safe and comfortable environment where students can relax after a hectic day of lecture and engage in activities that aid in the attainment of their academic pursuits. However, where factors relating to the building's micro-climate are not adequately considered costly mechanical systems may be required to maintain balanced indoor conditions especially in hot-humid climates. Passive cooling strategies focuses on how buildings can be adapted to the already changing climate to maximize occupant health and comfort by natural means. This paper shows the extent to which passive cooling strategies have been used in hostels of tertiary institutions in Niger State. Observation schedule and personal interviews were used to obtain data and analyzed using descriptive statistics. The results obtained from this study shows an average use of passive cooling techniques in hostel buildings which needs to be improved upon. Therefore as a result of the immense benefits inherent in passive cooling design of buildings, it is recommended that architects, planners and concerned parties in the building and construction industry emphasize a climate based design approach for building projects in Nigeria. Adopting the strategies will minimize energy consumption, provide comfortable indoor spaces for occupants and also support the agenda for a sustainable built environment.

Keywords: Energy consumption, Hostel, Passive cooling, Thermal comfort.

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RESILIENT CITIES AS A PIVOTAL COMPONENT OF CLIMATE VARIABILITY MITIGATION: LESSON FOR NIGERIAN CITIES

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An important way in which climate variability affect humanity is through its effects on human settlements, especially cities. Cities are engine for civilization, primary generators of human wealth and social interaction. Climate variability could affect the sustainability of human settlements through its impact on quality of life, flooding, pollution, demand for water, assimilation capacity of wetlands and changing the economic underpinnings of the settlement through changing productivity of croplands, forests, and fisheries etc. The aim of this paper is to explore the various global case studies on designing resilient cities across the global landscape. The methodology adopted for this research is a comprehensive review of literature on the pivotal role of building resilient cities in changing climate at the global level, exploring regional disparities in building resilient settlements; and the situation in the third world countries. Extant literature have shown that, while, most advanced economies and nations are breaking new grounds in building resilient cities, the sub-Saharan Africa are still enmeshed in acute web of Poverty, Food insecurity, Maternal and Infant Mortality, Perennial Flooding and other environmental issues thereby shifting their focus from the dangers of climate variability and its overall impact on their survival. It is therefore imperative for these third world countries to begin an integrated analysis of their challenges and mark the nexus between the various challenges observed in the human settlement and the scenarios of the global changing climate. It is therefore concluded that priority is necessary to build resilient cities in Africa to combat the menace of climate variability.

Key Words: Variability, Climate change, Poverty, Cities, Sustainability, Challenges

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MODELING THE ENERGY PROFILES OF TYPICAL BUILDINGS IN NIGERIA: A CASE STUDY OF SOKOTO, OSHOGBO AND MINNA

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The issues surrounding the need to cut carbon emissions in buildings include climate chang e, increasing energy cost and instability in major world supply sources of fossil fuel and the need to ensure energy security and create more employment. In many countries, the contrib ution of buildings to global carbon emission has already surpassed that of every other sector of the economy. The question of how much energy does the average Nigerian building con sume is still an open ended one. This paper presents a synthesis of energy supplied and utili zed in 50 buildings based on building energy audit using survey forms, physical examinatio n, onsite measurements and discussions with relevant stakeholders, conducted in three cities from different ecological belts of Nigeria to draw a basic energy consumption profile of resi dential, commercial and institutional buildings. The survey found the preponderance of the use of energy inefficient products, inadequate utilization of daylighting, complete absence o f building energy management systems, extremely low adoption of renewable energy syste ms and orienting building without due consideration to climatic variables.

Keywords: design assumptions, design process, mass housing, perception, user

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DAY LIGHTING AND SUSTAINABILITY OF OFFICE COMPLEXES IN NIGER STATE.

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Office complex is a collection of spaces or rooms that perform different services usually during the day which usually require adequate day lighting. Office complex must posses' adequate day lighting to ease movement of occupant, increase in the productivity of the staff and make conducive the office activities. With the recent development of model office complexes constructed in Niger state. Reports indicates that there is inadequate day lighting in office complexes, which affects office activities, discomfort to the occupant of the buildings complex, and frequently cause health problems to workers or accident while moving in the office building. This paper evaluates the causes of insufficient day lighting within the office complexes in Niger state and the rate at which artificial lighting is used in the office during the day. Information was collected through personal observations, and questionnaire administration to analyse the causes in the increase in the use of artificial lighting and insufficient day lighting in office building complex. The result shows the technological and human factors that are responsible for insufficient day lighting in office complexes, which include poor building design, poor finishes and materials used in windows at office complexes, and poor management. Finally outcome concludes that architects should design office complexes with consideration of natural lighting, and that building laws and regulations should ensure maximum opening to enhance sufficient daylight. These will minimize cost and positively boost the activities of the workers in the office.

Keywords: day lighting , office complex,

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WALK-THOUGH ENERGY AUDIT EXERCISE ON OFFICE BUILDINGS OF KADUNA CENTRAL BUSSINESS DISTRICT; NIGERIA

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The purpose of the study is to examine the pattern of demand, supply, distribution and consumption of energy in office buildings of Kaduna metropolis. To achieve this, a walkthrough energy audit was conducted on six purposively sampled office buildings through the collection of relevant data from their three-year bills of utility and back-up sources of electricity supply, and undertaking a survey of all energy consuming appliances and systems in the facilities to obtain its energy use index, estimated energy supply and put forward some energy saving opportunities through retrofitting. Results showed that cooling has the highest magnitude of energy consumption with 51% of the total energy consumption, while electrical equipment and lighting consume about 35% and 14% respectively. In conclusion it revealed that the annual energy supply on office buildings in Kaduna metropolis fall short of meeting up with their required annual demand, with cost of providing such energy heightened by the excessive use of backup generation systems due to inadequate and epileptic supply from the national grid. It was also discovered after the normalization exercise that; the cost of energy supply in the smaller buildings per square meter is higher than that of the larger ones. To evaluate the value of carrying out an energy audit, the energy-saving opportunities explored through retrofitting recorded an estimated 41% saving in energy cost and consumption. The relevance of this study therefore, is to provide a clear understanding of the energy supply and consumption pattern in office buildings of Kaduna metropolis, in order to help all related stakeholders pin point areas where cost of operation and maintenance of such a building stock can be focused open, and the kind of retrofitting measures to be subsequently adopted.

Keywords; Walk-Though Energy Audit, Energy Demand, Energy Supply, Normalization.

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EVALUATION OF PASSIVE COOLING TECHNIQUES IN GOVERNMENT OFFICE BUILDINGS IN MINNA NIGER STATE NIGERIA

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In a quest to better manage the rapidly depleting natural resources available to man, passive (natural) cooling techniques have been explored to effectively cool buildings without resorting to mechanized processes. In a state like Niger, located in sub-Saharan Africa, where high temperatures may lead to heat loading, it is necessary to find effective means of cooling the built environment without further stretching reliance on non-renewable energies, taking into consideration its finiteness. This paper therefore examined some secretariat buildings within Minna, Niger state. It employed the qualitative research method in analyzing the extent or lack thereof, of the use of passive cooling techniques. It also established suitable passive cooling strategies in Minna, Niger state. In addition to suggesting ways of adopting passive cooling strategies, the need to raise awareness on the comparative long term benefits was stressed.

Keywords: Natural resources, Passive cooling, High temperature, Heat loading, Sustainable approach.

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MUNICIPAL SOLID WASTE CONVERSION TO ENERGY AND DERIVED CHEMICALS USING PYROLYSIS

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This research work on municipal solid waste conversion to energy and derived chemicals w as investigated using pyrolysis. The variables such as time and temperature were used to det ermine the highest bio-oil yields. Slow pyrolysis was adopted in a drop type chemical vapo ur depositor (CVD) pyrolyser given the highest bio-oil yields of 32.50 %wt. at 500 ^{0}C for 3 0 min. The bio-oil properties (CHNS-O) at various temperatures were evaluated. Carbon, h ydrogen, Nitrogen and calorivic values were observed to increased as the temperatures incre ases, having highest values at 500 ^{0}C with a sudden declined at 550 ^{0}C. While oxygen, wate r contents, densities and pH values decreases as the temperature increased, with lowest valu es obtained at 500 ^{0}C and sharp increase at 550 ^{0}C. Hence, the degrees of de-oxygenation w as observed to increased as the temperature increases with 20.25 %wt. at 500 ^{0}C and decrea sed at 550 ^{0}C. The results of FTIR analysis of the bio-oils produced at 500 ^{0}C indicate funct ional groups such as alkanes, alkenes, amines, terminal alkynes and aromatic ether with thei r areas.

Keywords: Pyrolysis, Bio-oil, Derived chemical, Energy

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ASSESSMENT OF QUALITY OF NEIGHBOURHOOD AS DETERMINANT OF CHOICE OF LOCATION AMONG RESIDENTS IN BOSSO AND KPAKUNGU RESIDENTIAL AREAS OF MINNA, NIGER STATE.

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There are several empirical evidences that affirm the fact that the quality of the neighbourhood is a significant reason for choices of location among residents. The identification of household's level of education, income availability, crime rate, friendship, etc, has helped to understand why household would prefer a particular location over another. This paper evaluates the quality of a neighbourhood in relation to the choice of residence among households of Kpakungu and Bosso. Literature reviews, interviews and observations were employed to investigate the choice of residence among households in Kpakungu or in Bosso. Discussions and conclusions were made afterwards.

Key words: Households, neighbourhood, choice, determinant, Kpakungu, Bosso.

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Altine Maxwell Kyon, et al (2016). **ASSESSMENT OF QUALITY OF NEIGHBOURHOOD AS DETERMINANT OF CHOICE OF LOCATION AMONG RESIDENTS IN BOSSO AND KPAKUNGU RESIDENTIAL AREAS OF MINNA, NIGER STATE.** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

LIGHTING PERFORMANCE OF A FACULTY BUILDING: A CASE STUDY OF FEDERAL UNIVERSITY OF TECHNOLOGY MINNA

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Energy crisis is a major problem faced by the world today. Lighting system consumes a sig nificant amount of world energy resources. In educational buildings, a major portion of pow er is consumed by lighting. Continuous increase in energy cost also forces a search for a pos sible minimisation of energy in this area considering that adequate lighting is essential for t he visual comfort of humans and their performance. Therefore, it is very essential to analyse the lighting factors and energy consumption of buildings to provide comfortable lighting en vironment. In this work, a dynamic model of a faculty building with its existing lighting ins tallations was developed using DIALux Evo 3 software. Measured illuminance level at vari ous points within the building was used as input into the base case model. A proposed upgra de of this model using energy efficient installations such as the use of lighting emitting diod e (LED) lamps and lighting control strategies was investigated. Thereafter, energy consump tion calculations were carried out using the software. The upgrade to LED lighting results in about 71.66% of energy saving compare to exiting lighting installation. Similarly, the use of automatic switching on/off control and switch off using lighting energy numeric indicator (LENI) lead to an energy and cost reduction of 53% and 72% respectively.

Keywords: DIALux Evo, Lighting Modeling, Energy Efficiency, Lighting Co ntrol

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MAMBO Abdulhameed Danjuma & OPAYEMI Idowu Opeyemi (2016). **LIGHTING PERFORMANCE OF A FACULTY BUILDING: A CASE STUDY OF FEDERAL UNIVERSITY OF TECHNOLOGY MINNA** Sustainable Built Environment and Climate change; The challenges of Post 2015 Develop ment Agenda. School of Environmental Technology Conference, SETIC, 2016

ASSESSMENT OF NATURAL VENTILATION IN PUBLIC OFFICE BUILDINGS: CASE STUDY OF SELECTED PUBLIC OFFICE BUILDINGS IN NIGER STATE

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Natural ventilation is the sustainable means of ventilating spaces in a built environment. This process involves replacing air in any space to provide high indoor air quality and to control temperature. In office buildings, ventilation is very relevant as it aids the productivity of workers. Overtime, study has shown that most offices rely more on mechanical means of ventilations as a result of improper and inadequate provision of fenestrations in office spaces. This research aims to evaluate the adequacy of fenestrations provided in selected office buildings in Minna, Niger state. The research methodology to be employed will be a well-structured observation schedule to determine the position, number, size and type of fenestration provided in the selected public office building.

Keywords: building, fenestration, office, sustainable, ventilation.

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IGWE, Echezona Chukwuebuka and Abdulrahaman, Mukaila El-hussain (2016). **ASSESSMENT OF NATURAL VENTILATION IN PUBLIC OFFICE BUILDINGS: Case Study of Selected public office buildings in Niger State** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda School of Environmental Technology Conference, SETIC, 2016

ASSESSMENT OF USER'S PERCEPTION OF LANDSCAPE PROVIDED IN FACULTY BUILDINGS IN TERTIARY INSTITUTION, KOGI STATE

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People in the world today experience constant pressure and these pressures are products of cooperate forces which are increase in world population, technological advancement, and explosion of knowledge. Meanwhile, these developments have the tendency to get worse than better; they give a practical working assumption as to what future inhabitants might face or look like in respect to pressure. Although these developments each have different manifestation, they share similar effects. Specifically, they generally contribute to the occurrence of mental fatigue, which can make humans to be less healthy, less tolerant, and less effective. The above-mentioned problems are common with the learning environment which faculty buildings falls under. Contact with natural environment can perform a core role in decreasing this disastrous effect. This research focuses on the impact caused by the absence and inadequacy of landscape elements; using faculty buildings of tertiary institutions in Kogi State as area of the study. Data was collected using observation schedule and questionnaires of the forty three approved faculty buildings in the eight existing tertiary institutions. From the analysed data, it was observed that 88% of the faculty buildings were not properly landscaped. The research further seek to know how comfortable are the users in these environments, and it was discovered that a total of 86% of the users were not comfortable due to the lack of basic landscape elements that were not adapted, thereby reducing the hours willing to spend in the environment. Data showed that over 80% of users agreed that the adaptation of basic landscape elements will help increase productivity and also agree to spend more time leaning if the environment is well landscape. The research provides workable ways of improving the learning environment by adapting the relevant landscape elements, by the use of various plants that depict a particular function, activities, and feeling of a space. Spaces for indoor plants should be design to accommodate them, and architects should design landscape layouts in every faculty building design, putting into consideration their maintenance technique.

Keywords: knowledge explosion, mental fatigue, natural environment, landscape elements, maintenance.

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WASTE MANAGEMENT AND SANITATION

ASSESSMENT OF SOLID WASTE MANAGEMENT IN AKURE, NIGERIA

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Solid waste collection is one of the most difficult operational problems faced by many cities in Nigeria of which Akure is not exclusive. This situation has rendered our cities to become the eyesore of the nation and an invitation to health hazards. This study therefore, aims at assessing the methods of managing solid wastes in Akure with a view to achieving the desired environmental sanitation for good health of the people. Data on sources and types of wastes generated, methods of disposal, regularity of disposal, dumping sites and processing were obtained from 368 sampled respondents coupled with information gathered from the Ondo State Waste Management Authority (ODSWMA). Descriptive statistics of frequencies, percentages and Likert scale were used to analyse data got. The results showed that most solid wastes were from residential houses and the refuse were dumped at roadsides waiting for government truck. It was also found that ODSWMA truck cleared the wastes at least once in a week which the respondents adjudged satisfactory. It is recommended that the authority's refuse disposal trucks are well maintained while modern equipment for collection, recycling, processing, disposal and reuse should be procured for better efficiency.

Keywords: solid waste; refuse disposal; waste management; environmental sanitation.

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ASSESSMENT OF SOLID WASTE MANAGEMENT PRACTICES IN MAKERA WARD OF MINNA NIGER STATE

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As a result of industrialisation and rapid population growth (urbanisation) in many cities and towns, solid wastes are generated faster than they are collected, transported and disposed. Solid Waste Management remains one of the most pervasive environmental sanitation challenges facing contemporary cities in the country today and it has continually remained at its lowest capacity despite huge Government investments in the sector. Many cities in the country today, are suffering from sudden increase in solid wastes and their poor disposal. The volume of wastes resulting from plastic materials being littered in the streets, open spaces and public premises are becoming alarming. These wastes are often discarded without due regard to environmental sanitation. The concomitant effect of poorly controlled open dumps, drainage lines and illegal roadside dumping spoils the scenic resources of the city, pollutes soil and water resources and produce potential health hazards to the residents. This paper seeks to examine the waste management practices in Makera Ward of Minna Local Government Area. This is done through mapping out of the solid waste dump sites in the ward, identification of sources of generation, collection and composition of solid waste, amount of waste generated, methods of household solid waste transportation and solid waste disposal.

KEYWORDS: Solid Waste, Waste Management, Waste Disposal, Open Dumps, Environmental Sanitation.

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ASSESSMENT OF HOUSEHOLD SOLID WASTE MANAGEMENT TECHNIQUES IN SOME SELECTED INFORMAL SETTLEMENTS IN MINNA, NIGER STATE, NIGERIA

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Waste is easily generated than managed by households in Developing Countries. Despite the measures put in place by Government of various states across the country, waste is still a menace yet to be tackled. This has resulted in pollution of the environment due to the emissions of toxic gases from these wastes. The resulting effect is an endangered human life, an unsafe and defaced environment. The research examined the current household solid waste management in some selected informal settlements in Minna and also finding a suitable solution of handling these generated waste by various households. Data would be collected through Waste Reduction Study Questionnaire Survey of some households that were randomly selected. The research postulated that majority of the residents are concerned and affected by the poor state of their environment currently, due to improper and inappropriate solid waste management. Very few of the residents knew little about recycling and composting. Some locally effective solid waste management strategies have been suggested.

Keywords: environment, household, informal settlement, pollution, solid waste

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EVALUATING THE SPATIAL DISTRIBUTION OF OPEN DUMPSITES AND THEIR EFFECTS ON THE RESIDENTS IN BOSSO-MINNA, NIGERIA

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Open dumpsites are the most prevailing form of waste disposal in most developing countries like Nigeria – which has been battling with indiscriminate dumping of waste for decades without much success. The failure of waste management system and Sanitary landfill in Nigeria has resulted to an uncontrollable spread of different kind of disease epidemics such as Malaria, Typhoid, Cholera, Dysentery and many others, posing threats to human health and causing the death of many people especially those residing within close proximity and as well as polluting the land, air and water bodies. The problem has been worsened due to lack of spatial data on the location of the dumpsite as well as identifying the households that are more vulnerable to the diseases associated with uncontrolled dumpsites. This study therefore seeks to evaluate the spatial distribution of open dumpsite in Bosso, Minna using Geographical Information System (GIS) and to investigate their likely effects on the residents. The methodology employed in the study involved the collection of waste dumpsites' coordinates using Global Positioning System (GPS) receivers and using Arc GIS 10.0 to digitize the built up areas from the acquired satellite images, creation of attribute tables, buffer analysis, overlay operations and production of maps. Residents living within 100m buffer zone were classified as highly vulnerable to disease spread, those farther away from dumpsites by 200m were classified as being moderately affected while those residents above 300m from dumpsites were classified as having very low vulnerability to disease spread. The research revealed that most of the open dumpsites were located within the high density areas which clearly demonstrated a true characteristics of high density areas and few of these sites are noticeable in the low and medium density areas. About 50% of the entire buildings fell within the 100 to 300m buffer zone generated. It is therefore recommended that immediate evacuation of these open dumpsites be effected and strategic location of waste transfer stations established by the Government and authority concern.

KEYWORDS: Open Dumpsites, Waste management, Buffer, Spatial Analysis and GIS

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ASSESSMENT OF STORM WATER DRAINAGE SYSTEM IN SELECTED HOUSING ESTATES IN MINNA NIGER STATE

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Housing estate is the agglomeration of residential buildings with recreational facilities and services like good roads and storm water drainages. Therefore the role of storm water drainage system in the design and construction of housing estate cannot be under estimated, because poor storm water drainage system leads to destruction of building and discomfort to human movement. This paper examined the effect of storm water drainage systems in selected housing estate in Minna. Data were collected through Questionnaire administration and observation schedule to ascertain the effect of poor storm water drainage in the selected housing estate. Analysed data revealed that destruction caused by poor storm water drainage systems include flash flooding, soil erosion which exposes building foundation, destroyed road that discomfort movement of occupants. It is therefore recommended that storm water drainage and road should be constructed before building construction and in the design and construction of drainage system, the professionals involve should consider the relief of the land and also the slope of the drainage.

K**eywords**: Drainage systems, Housing Estate, Minna, storm water.

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INTEGRATION OF ORGANIC SOLID WASTE RECYCLING FOR IMPROVING THE ENVIRONMENTAL SUSTAINABILITY OF HOTELS IN MINNA, NIGER STATE, NIGERIA.

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Organic solid wastes are wastes that are generally biodegradable and decompose in the process that emits offensive and irritating smell when left unattended. The production of organic solid waste in vast quantities has become a major challenge on environmental sustainability as it is mostly used for landfill purposes. The decomposition of these wastes generates greenhouse gas and increases the production of leachate which causes environmental pollution. Therefore, the aim of this research is to assess the impact of organic solid waste on the environment. In achieving the aim of this research, data was collected randomly from hotels in the three senatorial district of the state with the use of observation schedule as well as close ended questionnaires. The results obtained show how indiscriminate dumping of solid organic wastes contaminates the environment. The findings explore the weak system of management by concerned bodies however; adequate proposals will be made to diminish the impact of greenhouse gases and improve the sustainability of the environment.

Keywords: organic, solid waste, environment, sustainability

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OTOMI Peter (2016). **INTEGRATION OF ORGANIC SLOID WASTE RECYCLING FOR IMPROVING THE ENVIRONMENTAL SUSTAINABILITY OF HOTELS IN MINNA, NIGER STATE, NIGERIA.** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

ASSESSMENT ON REFUSE DISPOSAL TECHNIQUES IN HOUSING ESTATES OF MINNA, NIGER STATE

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The generation and handling of refuse from housing estates determines the sanitary and wellbeing of dwellers. The improper disposal of refuse in such environment increases the rate of outbreak of deadly diseases which also negatively contribute to climate change. Refuse burnt by fire pollutes the environment with toxic gases. These toxic gases are not only harmful to human but to the entire ecosystem. Greenhouse gases (GHG) from landfills, smokes from combustion of refuse contributes to the wearing away of the ozone layer which exposes the earth to direct ray of the sunlight. This direct ray of the sun heats up the earth and give adverse effects on the earth and its contents which causes rapid change in climatic conditions. The improper disposal of refuse also results in the fast degradation of buildings in both the rural and the urban environment. This study examines the efficiency of refuse disposal techniques and the short comings in housing estates of Minna metropolis. Observations, interviews and the use of questionnaires were used to obtain necessary information form the people in the environment. Four housing estate was randomly selected through picking from the hat method of sampling. Data analysis was carried out using the SPSS statistical software while Microsoft excel spreadsheet was used for the final output. The paper concludes by providing the best method of disposing refuse without intoxicating the environment. It also recommends the proper refuse disposal system and encourages the government to provide NISEPA with adequate facilities to enhance the efficiency of the agency.

KEYWORDS - Environment, Housing Estate, Pollution, Refuse Disposal, Waste Management

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EFFECT OF SOLID WASTE MANAGEMENT ON RESIDENTIAL QUARTERS IN AKURE, NIGERIA

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Most of the residential areas in Nigeria are today grappling with the problems caused by mounting heaps of solid wastes from their environments. Several Nigerians have considered a cheap way of disposing off their solid waste by setting the mixed waste on fire in a little corner in their backyard or in a open place resulting in release of air pollution which is harmful to urban climate. Therefore this paper assessed the effects of the study of the solid waste build up phenomenon with a view toward finding ameliorative measures that would help reduce negative effect on residential beautification and sanitation and to provide insights into ensuring, reducing, minimizing and avoiding the evolving solid waste encroachment of city streets and roads. Closed and open ended questionnaires were administered on randomly sampled residents of some residential quarters in Akure, Ondo state, Nigeria and analyzed using simple descriptive analysis. The waste management generated lead to flooding, increased nuisance and visual environmental quality degradation of building open spaces , clogging of draining and traffic routes. The finding shows that there is variation in waste items, this shows a reflection of the income levels. Waste littering is common in some zones, while collection of wastes are not regular. The study shows that there are open burning of waste, irregular and in-frequent waste collection, dumping of waste in drains/gutters, absence of waste separation at source and waste sorting at dump sites by scavengers. The study concludes that greater investment should be made in the area of refuse storage, sorting, collection and disposal. Greater awareness of the need for cleaner environment is needed among the residents. This study recommends vigorous public enlightenments, re-introduction of hygiene studies from primary education, enforcement of environmental and waste disposal protection laws with policy statements to help achieve the healthy city concept of the United Nations.

Keyword: Solid Waste, Solid Waste Management, Residential Environment, Residential Building, Environmental degradation.

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Victor Olufemi Adegbehingbe and Sunday Adeluyi Bobadoye (2016). **EFFECT OF SOLID WASTE MANAGEMENT ON RESIDENTIAL QUARTERS IN AKURE, NIGERIA** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

FACTORS INFLUENCING HOUSEHOLDS' WASTE SEPARATION BEHAVIOUR IN LAGOS METROPOLIS

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Numerous studies on Municipal Solid Waste Management are hinged on the technical, administrative and institutional dimensions which failed to develop the kind of Waste Management strategies needed to encourage households to understand and participate efficiently in sustainable waste management practices. The aim of this study is to examine the extent to which the factors such as technological factors, economic motivations, socio-cultural factors and government policy, determine households' participation in separation and non-separation of solid wastes before collection and disposal. Using a multi-stage sampling technique, the residential neighbourhoods in the three selected local government areas of Lagos Metropolis were classified into low, medium and high residential zones for data collection. A structured questionnaire was administered on households of 388 residential housing units and data were analysed using descriptive and stepwise multiple regression tools. The findings revealed that the households (14.70%) that separate wastes before disposal are highly insignificant and the reasons or factors for non separation of wastes are determined by time consuming ($R^2 = 0.517$, $p < 0.05$), payment of collection fees ($R^2 = 0.118$, $p < 0.05$) and no incentive ($R^2 = 0.025$, $p < 0.05$). The conclusion is that households in Lagos Metropolis do not segregate their wastes before disposal because they considered it time consuming and no incentives as they also pay for the wastes collected. Therefore, there is need to adopt a sustainable wastes management strategy whereby adequate provision of wastes recycling banks is made to ensure reduction in time for wastes sorting, reuse of wastes materials to reduce environmental degradation; and proper enlightenment of wastes segregation for wealth creation and economic support for households' livelihoods.

Key words: Solid wastes, Wastes separation, Waste recycling, Wealth creation, Lagos Metropolis

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Ilechukwu, Victor and Chukwukaora, Ebere (2016). **FACTORS INFLUENCING HOUSEHOLDS' WASTE SEPARATION BEHAVIOUR IN LAGOS METROPOLIS** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC 2016

HEALTH AND SAFETY ISSUES

EFFECTIVENESS OF FROTH FLOTATION METHOD FOR THE BENEFICIATION OF BABAN TSAUNI (NIGERIA) LEAD-GOLD ORE

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The response of Baban Tsauni (Nigeria) lead-gold ore to froth flotation method was investigated in this research work. Value addition to run-off mines is always necessary in order to reduce downstream metal extraction costs. The work investigated the response of the ore to varying alkaline conditions, the presence of depressant and amount of collectors. Sodium ethyl xanthate was used as collector while the traditional frother (pine oil) was used. The work established that a pH level of 8.5 was best suited for froth flotation beneficiation of the ore. The work established the effectiveness of froth flotation for beneficiation of Baban Tsauni lead-gold ore. Flotation of the raw samples gave a lead recovery of 90.25% at a lead grade of 66.88% while flotation of pre-concentrated sample gave a recovery of 96% at a grade of 66%.

Key Words: Metals, Flotation, beneficiation, reagent, recovery, grade.

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ASSESSMENT OF FIRE SAFETY PROVISIONS IN TERTIARY INSTITUTION HOSTEL BUILDINGS IN NIGER STATE

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Fire safety measures have become an issue of neglect in most tertiary institution hostel buildings in Niger state and have contributed to the continuous fire outbreak. This has equally become a university management concern in our society today. This paper tends to assess the level of fire safety measures in tertiary institution hostel buildings by identify the problems and attitudes associated with fire outbreak in hostels and proffering solution through research approach that will help to prevent fire outbreak, restricting damage and maximize life safety in in tertiary institution hostels in Niger state. To achieve this, a well-structured questionnaire and observation schedule were used to acquire data in some selected tertiary institution in Niger state. The findings shows that the fire safety equipment is not available or not functional in the hostels also; most of the students in the hostels are not conversant with the usage of such equipment. Means of evacuation of students from the building during any event of fire are discovered to be below requirement. Door and window protectors cause hindrance to escape during fire incidence. Ineffective fire safety equipment management, ignorance of the professional during planning of stage is also a factor affecting the integration of the safety equipment and preventive measures. The research recommends that proper scrutiny of hostel buildings be made by the school management from time to time to ensure that all fire safety precautions are in functional condition, and orientation of students in the hostels about what to do in occurrence of fire outbreak.

Keywords: Fire, Fire Hazard, safety, Health, Hostel Building,

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LOCATION-ALLOCATION ANALYSIS OF PUBLIC HEALTH SITE SELECTION USING P-CENTRE MODEL: (CASE STUDY OF CHANCHAGA LOCAL GOVERNMENT AREA, MINNA, NIGER STATE)

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Healthcare planning is a challenging field that depends on spatial data such as location and characteristics of health center demand. Chanchaga Local Government Area lack adequate healthcare facilities. So, the need to locate new public healthcare facilities is necessary if distance with population is considered. Garmin 76CSx handheld GPS receiver was used to mapped the existing health facilities and overlaid it on a high resolution Satellite image of 0.5m (GeoEye-1))of the study area. Base on the analysis it was discovered that inadequate healthcare facilities have been the problem of the people in Chanchaga Local Government Area. Thus, there is need to site more new public healthcare facilities in other to solve the problem of uncovered areas in the study area by considering proximity (distance) to the demand (Potential users) using P-Centre algorithm in determining optimal location of public health facilities within study area with the primary goal of minimizing the maximum response time (i.e. Time between a demand site and nearest service location using a given number of service locations).Twenty healthcare facilities were found in the study area which actually shown that the facilities are randomly distributed using Nearest Neighbourhood Analysis in ArcGIS 9.3 Software. Thus, Factor and Constraint maps were produced and overlaid on the buffered of the existing public health facilities using ArcGIS 9.3 software. The study shows that, the health facilities were randomly distributed in the locality with four of them not suitably located affected by the factor criteria which need to be relocated to the proposed suitable site. Similarly, the research showed that the city heart's centre is enjoying more presence of public health facilities than the extreme North-West of the Local Government Council with fewer facilities.

Keywords: Geographical Information System, P-center, Facility, Wards, and Service Area

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PUBLIC TRANSPORT OPERATIONS AND MOBILITY NEEDS OF THE ELDERLY IN LAGOS, NIGERIA

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This study assessed the effects of existing public transport operations on mobility demands of the elderly along Mile 12 Bus Stop – CMS Bus stop, Lagos, Nigeria. Sets of structured questionnaire were administered on 85 operators and 137 elders respectively in seventeen major operational bus stops of the study area. Using multi-stage sampling technique, zones of operations, bus stops were identified and drivers and elders were respectively interviewed at each of the bus stops and motor parks for drivers. Data were analysed using descriptive (frequency tables) and inferential (Spearman's Rank Correlation Co-efficient) statistical tools for interpretations and discussion of results. The average elders' trip was 2 round trips per day as elders' travel time from residents to bus stops was 3.8 minutes. Also, the average operators round trips per day was 4 trips as 51.8% of operators perceived the condition of bus terminals in the study area as good. Results showed that most operators 45 (32.8%) rated the conditions of bus stops in the study area as fair as 32.8% of operators perceived the condition of bus stops as fair. It was also found that most respondents 86 (62.8%) observed surface covering from home to bus stops as non slippery in the study area as most respondents experienced tight buses as the most frequent difficulty in the study area while 36 (26.3%) respondents (elders) travel time was between 1-2 hours in the study area. The inferential statistics revealed a positive statistically significant relationship between rating of surface covering and elders' travel frequency ($n=137$, $r_s=0.178$, $p>0.05$). Also, there was a positive statistically significant relationship between curbs and stairs ratings and elders' travel frequency ($n=137$, $r_s=0.186$, $p>0.05$) among others. The study concluded through pragmatic strategies such as the need for assessment and upgrade of available buses to reduce tight and rickety buses, exceptions of elders in terms of stairs to be climbed and provisions of special buses in the study area among others.

Keywords: Public Transportation, Mobility Needs, Elderly

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VIABILITY OF FIRE ESCAPE ROUTES IN THE STUDENT HOSTELS AT SELECTED KATSINA STATE TERTIARY INSTITUTIONS

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Most of the windows in tertiary institution hostels are usually provided with security bars which may help to keep the hostels safe from intruders, but they can also trap students in case of fire outbreak. The tertiary institutions' administration should make windows and doors with security bars have quick release devices for easy opening in an emergency. This study addressed the problem of the devastating effect of fire which results in loss of lives and properties due to the fact that many tertiary institutions in Nigeria have given less attention to the fire safety programme. To address this problem, the study set out to assess the cost of provision of escape routes in the hostels of tertiary institutions in Katsina State in case of fire occurrence. Data were collected from the archive of the Works Department of four selected tertiary institutions in Katsina State and from direct measurement of floor areas, area of escape routes and number of escape routes (i.e. doors, corridors and staircases) from three hostels from each of the four selected institutions. Analysis of data was done with the use of regression analyses. Major findings from the study showed that there exists significant relationship between: i. the cost of providing escape routes and cost of construction; ii. population of hostel occupants and number of escape routes; and iii. floor area of hostel and area of escape routes. It was concluded that population of hostel occupants, hostel floor area, number of escape routes and area of escape routes have significant influence on the cost of providing escape routes in tertiary institution buildings. It was recommended that the projected number of hostel occupants and hostel floor area should be considered in estimating the cost and number of escape routes when designing for escape routes in the hostel buildings.

Keywords: fire escape routes, hostel floor area, population, tertiary institutions

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ASSESSMENT OF WHEELCHAIR ACCESSIBILITY IN FACULTY BUILDINGS AT THE FEDERAL UNIVERSITY OF TECHNOLOGY MINNA

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In order to achieve sustainability in any design, there is a need to create an enabling environment for all kinds of people, including the physically challenged. These physically challenged; Mobility impaired or wheelchair users in this case are rarely considered during the design and construction of institutional buildings. This has led to the promulgation of laws by the government of Nigeria on the design of accessible schools for all. Even at that, a lot of institutional buildings still do not cater for these wheelchair users. This paper seeks to assess the level of accessibility for wheel chair users in faculty buildings in the Federal University of Technology in Minna, which has two campuses, the main campus in Gidan kwano and the Bosso campus respectively. The data will be gathered using a descriptive survey method and analyzed using the SPSS software. The result of the analysis will reveal the extent of provision for wheel chair users and suggestions and recommendations will be made to ensure that spaces are designed to cater for the physically challenged.

KEYWORD: Accessibility Physically Challenged, Faculty Building, Circulation.

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REDUCING ACCIDENTS AND HEALTH HAZARDS IN THE NIGERIAN BUILDING INDUSTRY

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Accidents and health hazards owing to building collapse have been the talk of the day in the Nigerian building industry. The building team such as the architect, quantity surveyor, builder, engineer, and contractor are always blamed as a result of their indiscriminate attitude toward the construction of such building which has led to numerous lives wasted and injuries sustained. A descriptive research method through the conduction of oral interview and observation in some construction sites has shown that source of accidents and health hazards in the Nigerian building industry can be traced down to three main areas such as: design, construction and physical/environmental elements. This paper therefore, discussed the sources of accidents and health hazards in the building industry, and proffered ways to reducing such menace. It finally advocates that the National building code now in place should be enforced so that Developers would avoid the uncaring attitude of developing the Environment.

Keynotes: accidents, building industry, construction, design, environment

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Eze, Chukwudum J.[1], Ayuba, Philip[1], Shittu, Abdullateef Adewale[2] (2016). **REDUCING ACCIDENTS AND HEALTH HAZARDS IN THE NIGERIAN BUILDING INDUSTRY** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

ASSESSMENT OF ERGONOMIC FACTORS AMONG NON-ACADEMIC STAFF OF SCHOOL OF ENVIRONMENTAL TECHNOLOGY, FEDERAL UNIVERSITY OF TECHNOLOGY MINNA

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Implementing ergonomics in workplace improves health and safety among staff, increase job satisfaction of workers, thereby leading to increase work quality services and productivity. In a related development, ergonomics can also increase overall employees' morale, decrease workers compensation costs and decrease absenteeism and turnover among the workers. However, implementing ergonomic principles at work place has been low; hence this study assessed ergonomic related factors of workers within the School of Environmental Technology using physical measurement and personal observation of 10 non-academic staff. The 3 factors identified for assessment were anthropometric measurement (using measuring tape), light intensity measurement (using Lux meter) and quick exposure check (using checklist). The results of the anthropometric measurement assessment showed that only Hip width was found to match with current furniture for most workers, while other parameters were found to be highly mismatched. The results of quick exposure showed, that most workers have experienced moderate exposure levels for back (static and moving), shoulder/arm, wrist/hand and neck. Based on the lighting level at workstation of workers, there was an indication of inadequate lighting level. It can be concluded that based on the 3 ergonomic factors assessed, implementation level was low. Additional improvement to workers workstation is required coupled with long term planning of new chairs that are customized for workers need, ability to rest or lumber support with additional head support and adjustable table. This will enable the user to adjust the height of the table to ensure that his hand is able to wrest nicely on the table.

Keywords: Ergonomic, Anthropometric, Planning, Intensity, Workplace

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Y.D. Mohammed[1] P.O. Alumbugu[1] & R.A. Jimoh[2] (2016). **ASSESSMENT OF ERGONOMIC FACTORS AMONG NON-ACADEMIC STAFF OF SCHOOL OF ENVIRONMENTAL TECHNOLOGY, FEDERAL UNIVERSITY OF TECHNOLOGY MINNA** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

CLIMATE CHANGE AND THREAT TO SUSTAINABILITY OF THE BUILT ENVIRONMENT

REVIEW OF CHANGES IN CLIMATE AND SUSTAINABLE URBAN DEVELOMENT IN AKURE METROPOLIS

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This paper evaluates the change in climate and urban development sustainability of Akure in Ondo State, Nigeria. Urban development and the consequent change in climate have posed and are posing threat to existence of life. Many states in Nigeria lack the necessary coping capability required for coping with the impact of climate change. It has become necessary to integrate climate change concerns into urban development. This paper contributes to the dialogue on the linkage between changes in climate and the sustainability of man's activities. It examines the following specific issues; the incidence of change in climate in Nigeria, the vulnerability of Nigeria as a nation to climate change, and the consequences of climate change on urban development. Lastly it called for considerable urban activities in the urban area as a result of the consequences of climate change. Suitable measures are recommended in the study.

Keywords: Development, Climate change, Vulnerability

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Akure. j AKURE, J and ZACCHAEUS, M (2016). **Review of Changes in Climate and Sustainable Urban Develoment In Akure Metropolis** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

ADAPTING TO CLIMATE CHANGE FLOODING IMPACTS- A GUIDE FOR ACHIEVING SUSTAINABLE BUILT ENVIRONMENT IN NIGERIA.

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Flooding, a situation where land is covered with water (due to overflowing river caused by heavy rain) is one of the climate change natural disasters generated by human activities which constitute a threat to human life, property and the built environment. Although risks cannot be fully eliminated, however, adaptation to climate change can reduce the exposure and vulnerability to extreme climate and sustain the built environment. This work surveyed literature on climate change flooding and its effects on Nigerian built environment to find out that most developed nations with longer water bodies and greater exposure to flooding disaster have been able to curtail the negative effects of climate change induced flooding over the years than Nigeria were able to minimise the negative effects of climate change flooding on their built environment whereas, Nigeria with comparable minimum and manageable length of water bodies continuously have higher negative impacts from flooding. The study found that the application of adaptation theory will mitigate against the effect of climate change flooding and lead to the achievement of a sustainable built environment in Nigeria. The work eventually recommended concerted efforts of all stakeholders in the built environment to cooperate among themselves for the actualisation of gains of adaptation approach to climate change flooding in Nigeria towards achieving sustainable built environment.

Keywords: adaptation, built environment, climate change, flooding, sustainable-development.

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CONFRONTING THE CHALLENGE OF CLIMATE CHANGE ON BUILT ENVIRONMENT IN NIGERIA: UTILIZING A RESILIENT RESPONSE

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The world climate is changing as its attendant effects are now here. Nigeria, and indeed Africa may not be a major contributor to climate change, but bear the brunt of it together with the rest of the world. The implication of climate change in Nigeria is that more destruction will be added to existing dangers of poverty, disease and insecurity. The likelihood of more drought and desertification, flooding, erosion, storms and general ecological devastation will affect the environment, built space, and a large proportion of the population. The aim is to introduce the need to utilize resilience as an adaptive capacity against climate change in the built environment in Nigeria. An extensive literature review was done. The review indicated that the fight against climate change could be multi-dimensional and that poverty is the greatest clog in the wheel of any form of adaptation/mitigation strategies in Nigeria. Long lasting solution, lies in building resilience across communities in the built environment. This offers to engage the citizens at the grass root in preparing for the consequences of the climatic excesses with federal/state/local governments/and relevant institutions, together with civil society organizations that may key into the program to provide the lead, organization and financing as the way to preparing resilience for the built environment for climate change risks.

Keywords: built environment, challenge, climate change, resilient, response

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TAUHEED[1], I. A. and Alonge[2] ,D.O. (2016). **CONFRONTING THE CHALLENGE OF CLIMATE CHANGE ON BUILT ENVIRONMENT IN NIGERIA: UTILIZING A RESILIENT RESPONSE** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

CLIMATE CHANGE AND ITS THREATS TO SUSTAINABLE BUILT ENVIRONMENT

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The potential impacts of climate change are the greatest social and economic challenges that humanity is currently dealing with. It is also a known fact that mankind is the cause of climate change due to man's activities within the environment. A rapid and continuous warming will not only be disastrous to agriculture but also lead to the wide spread of death of forest trees, uncertainty in water supplies and the flooding of coastal areas. The rapid growth of urbanization is already causing massive air pollution and environmental degradation; this is a threat to sustainable built environment. Development anywhere carries with it environmental consequences that could ultimately negate the goals of the development process. As the built environment develops, access to clean water, rising levels of air pollution, and its consequences become problems. Most of these developments cannot be separated from the effects of high rate of population growth. Because of the environmental problems associated with built-up environments, and their implications, there is the need to rebuild the built environment, especially the unplanned areas. If adequate measures are implemented soon, they can reduce the social, economic, environmental, and political impacts of climate change. With the continuous rise in Mean Sea Level (MSL) as a consequence of global warming, all urban development and engineering activities must be properly and accurately controlled altimetrically by referencing them to the mean sea level and not the ellipsoid or other arbitrary datum if appropriate measures are to be taken to forestall the possibility of mass inundation in the nearest future especially in flood prone cities like Lagos, Minna, etc. One of the findings is that the world is showing increased interest in sustainable development and environment. Also the increasing human population is affecting the environment; the more the population growth, the worse the situation. It is recommended that laws and guidelines be put in place, and enforced, to guard against turning urban areas into slums and making the built environment unsustainable. There is the need to constantly strive for sustainable built environment in spite of climate change challenges which are enormous and affecting every facet of the human environment, including urban development and urban management. There should be adequate and frequent monitoring of growing urban areas.

Key words: climate change, environment, remote sensing, sustainable, built-up, geoinformatics

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EMISSION REDUCTION AT THE EXHAUST OF A DIESEL INTERNAL COMBUSTION ENGINE BY PARTIAL FLOW TECHNOLOGY

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This research work presents the development of a diesel exhaust of an internal combustion engine using the partial flow technology for the reduction of emissions. Exhaust emissions from automobiles have been a major threat to human life and the environment. Conventional automobile exhaust and mufflers have been of tremendous help in reducing the effect of these emissions. As the number of diesel fuel dependent automobiles in use increases, there is a further need to evolve a technology that will reduce the emissions. So an automobile exhaust was developed by the introduction of cascade stoppers to create a partial flow thereby reducing emission. When the developed exhaust was tested, the concentrations of CO, CO_2, NO_X and O_2 emitted through the exhaust were found to have reduced by 10.9%, 11.35%, 9.23% and 6.34% respectively.

Keywords: Diesel, Internal Combustion Engine, emission, exhaust.

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Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

CLIMATE CHANGE AND TREATS TO SUSTAINABILITY OF THE BUILT ENVIRONMENT: THE IMPACT OF CHARCOAL AS A SOURCE OF DOMESTIC COOKING ENERGY ON THE BUILT ENVIRONMENT, A CASE STUDY OF NIGER STATE.

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Charcoal is used in domestically in households for cooking energy, the demand of which is increasing due to the high cost of cooking gas and kerosene in the country. Large volume of forest trees are being destroyed in the process of charcoal production resulting to numerous environmental and climatic hazards. A combined effect of the processes involved in the production of charcoal and its use in households is rapidly declining the quality of the environment and its ability to sustain life. This paper discusses the impact of the use of charcoal as a cooking energy on the built environment in Niger state. The paper will identify the sports where charcoal is mostly produces and consume in the state and identify the impacts of the production and consumption on such sports. Data will be collected through direct observation and questionnaires and from the concerned ministries in the state. The results will be analyzed using simple statistical tools and tables and charts will be used for the discussion of the results. The paper will conclude by providing alternative measures to the use of charcoal and its production in the state.

Key Words – Built Environment, Charcoal, Climate Change, Cooking Energy, Environmental Hazards

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HUMAN CONTRIBUTIONS TOWARDS THE DEVASTATION OF FLOOD ON COMMUNITIES IN KADUNA STATE

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Rife is the gospel of sustainable development which has led to new millennium development goals with a 2030 deadline to improve the survival of life on earth in the face of the challenges arising from climate change. Climate change is a variation in the global weather pattern over a long period of time due to increasing atmospheric temperature resulting from the release of greenhouse gases. Consequently, related risks such as floods are on the increase and posing threats to human settlements through disease spreads, population displacement, injuries and in extreme cases, death. This paper has examined the impact of flood on the affected communities within Kaduna state. Particularly, it looked at the causes of flood in the affected areas, adverse effects and how human activities have influenced recurrence. Flood is a natural mishap primarily caused by heavy rainfalls and often times due to obstacles along water ways. The tragic incident in recent years has claimed lives and destroyed properties in several neighbourhoods. Using the descriptive survey method of research, questionnaires were administered in five (5) local government areas. Data obtained from the field were converted to descriptive statistics for ease of interpretation. The results show that flooding in Kaduna state is caused by accumulation of wastes dumped in drainages. 31.8% of respondents in Soba local government area blame urban development. This research pointed that property loss is the most common adverse effect of flood. In addition, 25% of the respondents suggested that the waste management system be improved. Finally, this research emphasises the need for educating the general public on human activities impacting on global warming.

Keywords: climate change, greenhouse gases, flood, global warming, rainfalls

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ENVIRONMENTAL IMPACT OF CONSTRUCTION OF GEN. M.I WUSHISHI HOUSING ESTATE ON VEGETATION AND CLIMATE

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In order to cope with the population growth, Urban Migration and impact of climate change, Nigeria like other developing counties demands for more developmental Building Construction projects. The nature of construction today, is such that it impact negatively on the environment in terms of its vegetation. Cutting down of trees and removal of shrubs and grasses has been one of the common practice at the most of the building construction sites. This paper aims at assessing the vegetation changes and subsequent climatic impact of the construction of General M.I Wushishi housing estate at Minna. The aim was addressed by highlighting the number of cut-down tress and affected area of ground cover due to construction activities. The data were collected at the site by used of methods of observation and oral interviews with the residence. The reforestation and soft landscape on the site after the construction was examined. Fifty nine housing units were randomly selected and assessed for afforestation and soft landscaping. Induction method was adopted to ascertain the vegetation density of the area before construction. The total floor area occupied by the constructed structures was also calculated. The outcome of the analysis exposes that mostly "non-economic trees" were destroyed in the course of construction. Afforestation was also significant and high at the three-Bedroom units, by the occupants. Information was also obtained from the project supervisors posted by the Ministry of Works and Housing Corporation. However, the consequences of deforestation highlighted include climate change, soil erosion and the greenhouse effect which have several effects on global ecology.

Keywords: Building counteraction, Ecology, Deforestation, Afforestation.

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ABDULSALAM M. A. & ARGUNGU A. S. (2016). **ENVIRONMENTAL IMPACT OF CONSTRUCTION OF GEN. M.I WUSHISHI HOUSING ESTATE ON VEGETATION AND CLIMATE** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

CLIMATE CHANGE INDUCED DISASTER

INNOVATIVE APPROACHES TO FLOOD RESILIENCE IN VULNERABLE URBAN COMMUNITIES: EXPERIENCES OF WOMEN IN MAKOKO - LAGOS, NIGERIA

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The urban poor are especially vulnerable to the vagaries of climate change. This paper seeks to understand how flooding affects womens'everyday practices in a low income coastal community – Makoko, Lagos. This paper considers the impact of flooding on the community and using the theoretical construct of the livelihood framework, identifies the challenges being experienced in the community. The study utilised qualitative research methodology gathering data through focus group discussions and in-depth interviews with female members of the community. The study revealed that poverty was both a cause and consequence of flooding in the community as most of the houses were built on environmentally fragile land with poor drainage. Many houses were built on waste landfills. Furthermore, the four zones that make up Makoko were seen to be carrying out independent flood mitigation activities. The paper concludes by recommending an integrated stakeholder approach for flood management, poverty alleviation and community development in the area which integrated inclusive development (community participation), urban planning (provision of drainage channels) and livelihood (urban agriculture) strategies.

Keywords: community, flooding, Makoko, poor, women

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LAWANSON, T. and ODUNBAKU, O. (2016). **INNOVATIVE APPROACHES TO FLOOD RESILIENCE IN VULNERABLE URBAN COMMUNITIES: EXPERIENCES OF WOMEN IN MAKOKO - LAGOS, NIGERIA** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

FLOODING AND THE LIVELIHOOD OF RESIDENTS ALONG BENUE RIVER, MAKURDI

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Flood is a natural phenomenon that is associated with endemic destruction and devastating effect on human lives and properties. As a growing natural phenomenon, the resultant effect is targeted at social and economic obstruction to human livelihood. Research reveals that climate inconsistency is a major player in the many changes that occur within the environment. This review reveals studies on flooding, bringing to limelight people's perception and coping measures on the recent occurrence of flooding and its negative effects on the inhabitants of Makurdi town, Benue State. Conclusions are that flooding will continue to occur due to climate inconsistency but with adequate policies and processes targeted at enforcing aggressive infrastructural provisions and public awareness and sensitizations, human lives and properties will be saved.

Keywords: Climate change, flood disaster, livelihood.

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Nenger-John Danjuma E.T[1*] & Umar Haliru Vulegbo[1] (2016). **FLOODING AND THE LIVELIHOOD OF RESIDENTS ALONG BENUE RIVER, MAKURDI** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

IMPACTS OF CLIMATE CHANGE ON FLOODING INCIDENCE IN ZARIA, NIGERIA.

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The human populations, infrastructure and ecology of cities are at risk from the impacts of climate change which affect urban ventilation and cooling, urban drainage and flood risk and water resources. Built areas exert considerable influence over their local climate and environment, and urban populations are already facing a range of weather-related risks such as heat waves, water pollution and flooding. Although climate change is expected to compound these problems, building designers and spatial planners are responding through improved building design and layout of cities. This paper examined significant climate change impacts expected to shape the future character and functioning of urban systems, in Zaria, people's attitude to the change, the findings have serious implications for how hazards are managed. The paper also stated categorically strategies for managing and preventing climate change on built environment. The importance of public awareness through effective hazard education was also suggested.

KEYWORDS: Build Environment, Climate Change, Sustainable Development.

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EFFECT OF FLOOD DISASTER ON THE FOOD SECURITY STATUS OF CASSAVA FARMERS IN KOGI STATE, NIGERIA: EMERGING ISSUES FOR THE POST 2015 UNIVERSAL SUSTAINABLE DEVELOPMENT AGENDA

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The flood disaster which ravaged Kogi State in 2012, left in its trails, colossal devastation, including destruction of farm houses, farmlands, crops, livestock, and other personal effects, with associated displacements, culminating in food shortages, human morbidity and mortality, amongst others. This study therefore examined the: food security status of the respondents; determined the effect of the flood disaster on the food security status of cassava farmers and identified the coping strategies used by respondents to cushion the effect of the flood. The study used cross-sectional data covering 120 respondents; quasi-experimental design, food security index, double differencing estimates, Tobit model and t- test of significance to achieve the objectives of the study. The results revealed that food insecurity increased by 12.5% amongst the flood affected cassava farmers compared to a decrease of 21% within the control group. The double differencing estimate of -1.3 further confirmed that the flood disaster had a negative effect on the flood affected farmers. However, the t-test of significance established that any difference in the food security status of the two populations at 5% probability level could only have been due to chance. The Tobit regression results further affirmed the absence of a causal link between the flood disaster and respondents' food security status at 5% probability level, probably, due to the short term nature of the incident, customary coping strategies adopted, prompt response by the governments and development partners. In spite of these efforts, but considering the magnitude of food insecurity established, there is the need to critically review the food security situation in the state and align the food security strategic plans and objectives to the national and global frameworks, particularly, those bordering on Sustainable Development Goals 2 (zero hunger) and 13 (climate concerns) respectively, with the view to achieving an enduring and sustainable food security for its over 3 million population, within the context of the Universal Sustainable Development Agenda.

Keywords: Climate Change, Flood, Food Security, Sustainable Development Goals.

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CLIMATE CHANGE INDUCED DISASTERS

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Climate change is one of the most critical challenges facing human beings. The impacts range from rise in sea level, increased incidences of drought and flooding, melting ice caps and glaciers, and so on. The change is already leading to more agricultural shortfalls, spread of vector borne diseases and endangered water security. The world has recognized that climate change is no longer solely on environmental problem. Rather, it has become an economic and security issue that will increasingly dominate global and national policies as its impacts become more apparent. Whilst mitigating climate change is highly imperative, its inevitable effects should be concretely looked into. The effects are felt mostly by the developing countries who are the least responsible. Since climate change is a global problem, it needs a global response that embraces the interests and needs of all nations. This paper examines the causes of climate change, projections for climate change, the impact of climate change on key sectors, the impact of Africa, Asia and Europe, climate change and induced disasters and methods and strategies of addressing the problem. Conclusion and recommendations were drawn from the observed reports.

Keywords: Mitigation, Critical, Agriculture

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Nwose, I.A[1] , Gbedu, A.M[2] , & Ibrahim P.O. (2016). **CLIMATE CHANGE INDUCED DISASTERS** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of En vironmental Technology Conference, SETIC, 2016

DESIGNING THE HUMAN SETTLEMENT FOR CLIMATE CHANGE

ASSESSING THE IMPACT OF KADUNA STATE UNIVERSITY, KAFANCHAN CAMPUS ON ITS HOST COMMUNITY, BINZOM – THE BEGINNINGS OF AN UNSUSTAINABLE RURAL TRANSFORMATION IN BINZOM COMMUNITY

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Since the inception of the Kafanchan Campus of Kaduna State University (KASU), in Kafanchan,Jemma'a local government area of Kaduna State, there have been notable changes in the rural landscape of the most immediate host community- Binzom,as it transforms to accommodate the university with its teaming population of staff and students. This paper therefore aims at assessing the impact that KASU, Kafanchan campus, has had on Binzom, in terms of environmental transformation and infrastructural developments. The methodology adopted includes qualitative and quantitative research methods based on multiple data sources, analyzed using descriptive and logical techniques, designed toshed light on the subject of unsustainable development, determine the population impact of KASU on Binzom, and identify the key changes in the community. The study revealed that rapid unplanned, informal development is taking place in Binzom at an unsustainable rate, even as farmlands are converted to residential layouts; private hostel accommodations are built up, and old/existing buildings are remodeled/redeveloped into student hostels; all of which is done without adequate professional design, planning and control/regulation. Thus proper design, planning and development control is needed to inhibit unsustainable rural transformation; and a system of public private partnership is advocated to aid the effective development of hostel accommodation for students. This research will hopefully add to the existing body of knowledge on the effects of rapid urbanization; provide a glimpse into the beginnings of the cause and effects of rapid development in Binzom; and also provide a basis for further research on the subject.

Keywords: unsustainable, rural transformation, Urbanization

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Musa, S.H and Shamang, K. (2016). **ASSESSING THE IMPACT OF KADUNA STATE UNIVERSITY, KAFANCHAN CAMPUS ON ITS HOST COMMUNITY, BINZOM – THE BEGINNINGS OF AN UNSUSTAINABLE RURAL TRANSFORMATION IN BINZOM COMMUNITY** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

ASSESSMENT OF THE IMPLICATIONS OF URBAN GROWTH IN SULEJA BETWEEN 1987 AND 2014

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Cities in developing countries are often characterized by uncoordinated growth. Accompanying this growth are various problems which include traffic congestion, emergence of slum, flooding, uncollected solid waste and poor sanitation. These problems pose a critical challenge to cities in developing countries. Suleja which is one of the most urbanized local governments in Niger State and also proximate to Abuja the Federal Capital Territory is experiencing the identified problems.This study therefore examines the extent and implications of urban growth in Suleja between 1987 and 2014. Spatial analysis of the city for the period understudy (1987-2014) and implication of the growth on the residents and environment were determined.Primary and secondary data as well as Geospatial techniques were used for the study.Two sets of satellite imageries were used for the study that is, Thematic Mapper for 1987 and Enhance Thematic Mapper for 1997, 2007 and 2014. The findings of the geo-spatial analysis were corroborated with the findings of the primary and secondary data sources. The analysis reveals that Built-up area in Suleja increased from 10.91km^2 in 1987 to 46.25km^2 in 2014. While the 35% of the building plans submitted for approval to Niger State Urban Development board, Suleja are approved annually. The study also revealed that the pollution level of Suleja which was consequential to the increase in growth recorded a high value of 15.97 ppm for CO, 0.67 ppm for NO_2 and 1.33 ppm for SO_4.The study recommends that the planning and management of Suleja should be based on inclusive planning approach more so, infrastructure should be systematically expanded at a rate equal to the rate of the urban growth in Suleja.

Keywords: Pollution, Slum, Solid waste, Spatial growth, and Urban growth

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Adeleye et. al. (2016). **ASSESSMENT OF THE IMPLICATIONS OF URBAN GROWTH IN SULEJA BETWEEN 1987 AND 2014** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

USERS PERCEPTION ON LANDSCAPE FEATURES OF OFFICE BUILDINGS IN ABUJA NIGERIA

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The provision of landscape elements in buildings can dampen the movement of air and as such affect air flow rate and patterns within buildings. There is a great need to reduce energy consumption in office buildings due to escalating environmental problems such as Urban Heat Island effect and global warming. The safeguarding and enhancing sustaining building is important planning objective, with the use of landscape. Sustainable of office building design is one major challenge for Architects and Built Environment professionals in an attempt to sustainable environment. The environmental and economic benefits of trees have been studied relative to a variety of interests including their influence on office buildings value in Abuja. This study investigates the effect of trees and landscaping on office buildings, based on a comparison of 22 office buildings in Abuja area. Data that describe the quantity, functionality, and quality of landscaping were gathered from each of the buildings including landscape maturity, the percentage of ground cover (trees, turf, pavement), and functional attributes (building shade, noise buffer, space definition, recreation, visual screen, and aesthetics). The problem with majority of the offices provided in Abuja is open space and undefined area within and around the buildings. This paper examined user's perception on landscape features of office buildings in Abuja Nigeria. The research method adopted for this study is a mix method approach with the use of observation schedule and structure questionnaire. The data obtained was collated and entered into SPSS package and was analyzed using the non-parametric tools. The result was collated using chats while plates were used to show graphical details observed from the field. The result showed that very little attention are been paid to the issues of landscape elements in office building designs in Abuja and that attention has been focused on the aesthetic aspects of office designs. These papers conclude that there is need to develop a home grown approach towards design offices that responds to establish ways of conserving and enhancing the benefits of existing hedgerows (closely planted trees), trees, woodlands (vegetation), streams, wetland areas and other natural features. The paper recommends the use of landscape features (elements) to enhance, safeguard and sustaining of office buildings in Abuja Nigeria.

Keywords: Buildings, Landscape Features, Environment, Office Design, Sustainable

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ADEDOKUN Adebayo John, et al (2016). **USERS PERCEPTION ON LANDSCAPE FEATURES OF OFFICE BUILDINGS IN ABUJA NIGERIA** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

INTEGRATION OF RECREATIONAL SPACES IN HOTEL BUILDINGS TO IMPROVE USER COMFORT IN MINNA, NIGER STATE.

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Hotel buildings are designed to provide hospitality and comfort to its users at all levels. This is normally achieved basically by the provision of accommodations and the integration of other services and functions that meets the need and also aid the general comfort and well being of hotel users. The poor integration of recreational spaces within hotel building or in an hotel environment is one amongst other problems that has affected the standard of services as well as the level of comfort derived by hotel users in Nigeria. This research aims to evaluate this problem by the examination of the users perception on the recreational spaces as provided or to be provided in hotel buildings in minna, Niger state. In order to achieve this, a well designed questionnaire and observation schedule was used to get firsthand information from hotel users on whether or not hotel owners in Minna, Niger State have successfully satisfy their recreational needs in terms of the provision of recreational facilities in selected hotel buildings. The research shows that although, all the selected hotels provides for one or two forms of passive recreation, but the active recreation have been neglected because only few of them provided for active recreation. The results also reveals that majority of the respondents are not satisfied with the recreational facilities provided, but were okay with the positions of the recreational spaces. Therefore, it is recommended that more variety of recreational spaces should be integrated into hotels buildings in Minna, with keen attention to the active forms of recreation, in order to promote the comfort of users.

Keywords: Comfort, Hospitality, Hotel-Buildings, Integration, Recreation

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ABUBAKAR, Olaitan Abdulrazak (2016). **INTEGRATION OF RECREATIONAL SPACES IN HOTEL BUILDINGS TO IMPROVE USER COMFORT IN MINNA, NIGER STATE.** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

THE IMPACT OF HOUSING TRANSFORMATION ON THE QUALITY OF THE ENVIRONMENT OF RESIDENTIAL BUILDINGS IN GOVERNMENT ESTATES IN SOUTH WESTERN NIGERIA

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Housing transformation activities on the quality of environment of residential building has affected all factors of the built-environment and has elicited grave concern from the professional and non-professional alike. This paper examines and evaluates the impact of housing transformation activities on the Quality of Environment of residential buildings in three housing estates in South-Western Nigeria, were data were selected , with a view to identify the factors for the phenomenon, and examining the trend of the transformation . The use of questionnaire, personal interview of some design professional involved in the management of the selected study estates were carried out. Analysis were carried out through the use of simple frequency table and Chi-Square test. The study reveals that a large percentage (49.4%) indicated that transformers are enhancing the quality of the environment and also providing infrastructure to the neighborhood and provision of service area in the stud area. The study concluded that in reducing the need for housing transformation in the study estates design professional should rely on functional architectural design, provision of service areas within the estates are involvement of end users. Flexibility should be brought into design of residential buildings on government estates to accommodate extension as phase construction in order to meet future demands of owners. Findings revealed that housing transformation activities resulted into reduction in environmental qualities of the study estates and that the housing transformation activities results in both positive and negative impact and these were adequately appreciated and addressed. This paper recommendations include the improvement and enforcement of environmental protection laws, which are already in place, enforcement of planning laws, the need to increase the number of staff of the planning approval authority in the housing corporation responsible for the management of the estates under study, need to educate the occupants of the study estates on the negative influence of indiscriminate housing transformation on the quality of residential environment.

Keywords: Built-environment, environmental quality, Government Estates, housing transformation, residential building

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Victor Olufemi Adegbehingbe (2016). **THE IMPACT OF HOUSING TRANSFORMATION ON THE QUALITY OF THE ENVIRONMENT OF RESIDENTIAL BUILDINGS IN GOVERNMENT ESTATES IN SOUTH WESTERN NIGERIA** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

ASSESSMENT OF NEIGHBOURHOOD INFRASTRUCTURE CONDITIONS IN MINNA, NIGERIA

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Infrastructure provision is very vital in the overall development of any society; yet it remains a major challenge confronting many cities. Its availability in term of quantity and quality is an important yardstick in the assessment of the quality of the environment. Infrastructure in the context of this study is the physical infrastructure which are the general neighbourhood facilities supporting the existing houses. Hence this study assessed the conditions of infrastructure within the Peripheral residential neighbourhoods in Minna, Nigeria. Data for the study were sought from both primary and secondary sources. A sample size of 600 was drawn out of the total 18, 387 households in the sampled neighbourhoods using estimation method. Estimation rate of 50% and precision range of ±4 were adopted in determining the sample size. Systematic random sampling method was adopted in the administration of the questionnaires while infrastructure conditions were assessed using eleven (11) variables which were rated on 5 point likert scale and summed up to determine the 'perfect condition' score. A summation of all scores by a particular neighbourhood was divided by the perfect condition score, to determine infrastructure quality index number. The rating scale ranges from 0 -1 (Very Poor= 0.00-0.19; Poor 0.20-0.49; Fair 0.50-0.74; Good 0.75-0.94 and Excellent= 0.95-1.00). Quantitative and descriptive methods were used in analyzing data. Results of analysis revealed that infrastructure conditions in the neighbourhoods are fair; with infrastructure indices ranging from 0.52 to 0.65. This implies that, infrastructure provided within the sampled residential neighbourhoods are not adequately meeting the household present demands due to their deplorable conditions. The study recommended government and community interventions in the refurbishing and provisions of necessary infrastructure needed to support development and for the enhancement of quality environment.

Keywords: environmental quality, Infrastructure condition and Peri-urban neighbourhoods.

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STRATEGIES FOR IMPROVING INFORMAL INTERACTION IN STUDY OF SCHOOL OF ENVIRONMENTAL TECHNOLOGY, FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, USING ISOVIST VISIBILITY GRAPHS

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This paper discusses the concept of an isovist, derived from architectural literature, and shows how isovists can help architects understand visibility and its importance in a physical environment. An isovist is defined as the set of all points visible in all directions from a given vantage point in space. The overlap between two or more isovists locations can be used to assess reciprocal visibility and thereby assist in the design of offices, commonly utilized spaces and even office/staff allocations. This work illustrates the value of isovists for architectural design using field data from a faculty building in the Federal University of Technology, Minna. The paper also shows how an isovist analysis can be used to propose alternative design solutions at design and even post-design stage. The as-built plan of the school of Environmental Technology (S.E.T) building, Federal University of Technology (F.U.T), Minna was developed using AUTOCAD 2014 software and analysed with DepthmapX; using isovist visibility graphs: a space syntax tool to reveal the relative connectivity and visual integration of the designed spaces with interesting results. The paper also proposed probable alterations to the present design of the S.E.T building thereby revealing higher levels of connectivity and integration. The analysed as-built plans which showed average (av.) connectivity of 3775.22 and average (av.) visual integration values of 10.8 were seen to have increased positively after alterations, to 3830.45 and 11.1 respectively. The paper recommended that this method be adopted in the analysis of proposals especially in environments that require its users to provide productive outcomes through face-to-face interactions.

Keywords: Connectivity, integration, isovist, space syntax, physical environment,

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CONCEPTUAL ISSUES ON CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT

LANDSCAPING FOR PASSIVE SECURITY AND ADAPTATION FOR CLIMATE IN CHURCH ENVIRONMENT NIGER STATE, NIGERIA

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Nigeria is faced with several risks ranging from problems of climate change to security challenges and this is not limited to a specific aspect of the built environment as all buildings and environment are affected. The places of worship are greatly affected in terms of security which affects the disposition of Christians during worship at churches. Many of the studied churches were seen to have made use of landscape elements but these went placed with the aim of using them to deter intrusion as in the case of security but rather for beautifying the church. The challenge for architects and church administrator is how to cope with challenges of security and climate change. This paper examines landscaping as a catalyst for deterring intrusion of threats passively and enhancing climate adaptation in church environment in Nigeria. The research method adopted for this study is the descriptive survey method by collecting qualitative and quantitative data. The results were analyzed using descriptive tools in SPSS and are presented in tables and charts while the pictures are presented in plates. The study reveals that it is possible to achieve passive security and solve some climatic challenges in church environment using soft landscape elements. The paper is concluded by determining the aspects of the building where the architect can infuse the specific landscape elements to achieve the aim of the paper. It further states the type of landscape elements that could be used to achieve the aim of the study hence developing a responsive building design scheme.

Keywords: Adaptation, Building, Climate change, Security, Soft landscaping

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RETROFITTING FACULTY BUILDING WITH EXTERNAL BALCONIES FOR ADAPTATION TO CLIMATE CHANGE

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Evidences of climate change include change in temperature, rainfall, heat, and wind patterns. These have affected the behaviour of man and his responses to the environment particularly the built environment. The growing nature of our cities and the overall effect on the office building environment has ensured that the present office buildings in many Nigerian universities cannot respond to the changing climate. A major problem with the present faculty office buildings is the amount of heat gain by the building and the uncomfortable interior environment it generates hence requiring a lot of energy to keep it cool. There is need to seek alternative ways of making the building respond to the climate change. The aim of this study is to examine ways of retrofitting existing faculty buildings in tertiary institutions to respond to the climate challenges. The research method adopted would be a qualitative method with the use of Observation schedule. Six tertiary institutions in Niger State would be selected for this study and the data generated will be analysed using non-parametric statistical tools in SPSS. The results will be presented in tables, chats and plates. In conclusion the paper would recommend the retrofitting of balconies to faculty buildings as a way of improving the climatic response.

Keywords: buildings, climate change, faculty, retrofitting, offices

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SOIL CARBON DIOXIDEEFFLUX IN THREE DIFFERENT CANOPY DENSITIES OF TROPICAL FOREST, PENINSULAR MALAYSIA

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Soil CO_2 efflux has been identified as playing a key role in the forest carbon balance, hence, it is essential to understand soil CO_2 efflux in different stand densities and carbon cycles. The aim of this paper was to determine the influence of environmental and biological factors on soil CO_2 efflux under different forest canopy densities. The selection of the experimental plots was based on stand density, which strongly affects the estimation of soil CO_2 efflux as well as the environmental and predictor factors. A detailed study of soil CO_2 efflux, its environmental and predictors factors were conducted in three different forest canopy densities with the same physical-geographical environmental conditions in the 30 years Dipterrocarp Ayer-Hitam research forest of Universiti Putra Malaysia. Three compartments based on Leaf Area Index (LAI) of dense, open and moderate canopy sites were studied. Measurements of soil CO_2 effluxes were conducted using a continuous open flow chambers technique connected to a multi gas-handling unit and infrared CO_2/H_2O gas analyser. One-way ANOVA and the multiple linear regressions indicated the impact of environmental variables and biological processes on soil CO_2 efflux across the different canopy densities. Soil CO_2 effluxes ranged from 114.31-467.57mg/m^{-2}/h^{-1} ($P<0.001$), 76.26-459.84mg/m^{-2}/h^{-1} ($P<0.001$) and 98.18-510mg/m^{-2}/h^{-1}($P<0.001$) in dense, open and moderate canopies, respectively, with the highest CO_2 emission from the moderate forest canopy. Generally, high soil moisture and soil temperature signify the most influential factors controlling soil CO_2 efflux. As predicting variables, soil organic carbon (SOC), total organic carbon (TOC), litter fall carbon and nitrogen (C&N), soil moisture content and porosity (bulk density) account for the spatial and temporal variation in soil CO_2 efflux. These explain the impact and significant contribution of the environmental factors and biological processes on soil CO_2 efflux across the 30-year Dipterocarp canopy densities.

Keywords: Canopy density, Carbon budget, Forest ecosystems, Leaf Area Index, Litter fall, Soil CO_2 efflux

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SUSTAINABLE BUS TERMINAL DESIGN WITH ADAPTATION TO CLIMATE CHANGE.

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The adaptation to climate change in every aspect of living today has encouraged the perspective and changed the approach employed in addressing different situations. In developed countries, buildings are built to withstand the constant change in climatic conditions therefore making them sustainable. Sustainable design would then be the ideology of designing public buildings, commercial and even residential buildings to adapt to climate change. Climate change is universal and as such Nigeria is not an exception to its effect. Public buildings like bus terminals are structures that are constantly used in Nigeria, because it's the major form of transportation, as a result of this every state in the country has over five bus terminals registered in the state. The designing of bus terminals to adapt to climate change through sustainable measures is one that can be addressed and achieved architecturally. This research assessed the different measures of adopting sustainable design in bus terminals to suit the current climate change. An observation schedule was employed to gather data and spss17 was also used to analyze the data, illustrations and graphics were presented using Microsoft excel. This research would finally show that the measures for sustainable design in bus terminal using available techniques was not considered in the designing of bus terminals, therefore it is necessary to strictly implement sustainable design measures to curtail the frequent climatic change situations in the designing of bus terminals.

Keywords: **B**us terminal, Climate change, Design, Sustainable design

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INVESTIGATION OF THE EFFECT OF SEA LEVEL VARIATION ON VERTICAL REFERENCE FRAMES BASED ON A DESIGNED EXPERIMENT

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The Mean Sea level as a result of its "near-coincidence" with the equipotential surface of the geoid is universally adopted as a reference surface for the physical realization of the vertical reference system. Unfortunately, the effect of climate change has continued to alter the value of the mean sea level across the globe by as much as 10mm per annum at certain locations. The Gauss-Markov functional model has been used in this study to determine the effect of Sea Level variation on sea-related physical heights along the ZTT-control series in Lagos state using the different International Association of Geodesy (IAG) standard geo-potential values as representative indicators of sea level rise. Results obtained show very minimal effect of MSL variation on the VRF with a standard deviation of ∓ 0.000000000015 m

Keywords: Climate Change, functional Models, GNSS Levelling, Height Systems, Vertical Reference Frames (VRF).

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CLIMATE CHANGE, RELATED EVENTS AND THE CHALLENGE OF SUSTAINABLE ENVIRONMENTAL QUALITY: THE NIGERIAN EXPERIENCE

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This paper discusses with empirical evidence the state of climate change in Nigeria by studying 12 communities in Itu Local Government Area of Akwa Ibom State documented as being flood prone zone by the state government. The study adopted survey design. Primary and secondary sources were used to obtain data for the study. A total number of 400 copies of structured questionnaire were distributed to elicit data in addition to those gathered from observation. The data so gathered were analyzed using Multiple Linear Regressions (MLR) and Relative Effective Index. The study revealed that the people of the area had devised some coping strategies which included: Use of Contours and Barriers, Building Elevated Surface, Strengthening of Building Materials, Use of Floated Canoes, Use of Local Building Materials, Use of cover crops, Early Planting etc. and that those strategies had helped in mitigating the effect of climate change related events especially flood. The paper recommends that the various agencies of the government should be properly funded to carry out research especially in the area of improving the coping strategies of the people of the study area with a view to incorporating them in National Planning.

KEY WORDS: Climate Change, Sustainable Environmental Quality, Flood.

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INVESTIGATION OF THE IMPACT OF SUNSPOTS ON EARTH'S CLIMATE

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World history of the effect of climate change on humanity is enough witness to attest to its lethal effects. Various researches have delved into the investigation of the probable causes of variation in earth's climatic condition, with majority of such researches concentrating more on the impact of the changes in the reflectivity of earth's atmosphere, surface and increase in the emission of greenhouse gases into the atmosphere chiefly propelled by human inducement, while little has been done to investigate the impact of the temporary phenomena on the photosphere of the Sun that appears visibly as dark spots compared to surrounding regions (Sunspots). Using Global sunspots and annual temperature anomalies data of 1900 - 2014, attempt has been made in this research to investigate temporal variation of the trend of sunspots and their impact on earth's climate since temperature is one of the basic indices that define climate while the sun is the fundamental source of energy that drives our climate system. The result shows that the earth is getting warmer over the years as increase in years lead to increase in annual temperature anomaly. A very weak correlation was observed between the global mean sunspot number and the annual temperature anomaly while there is a positive correlation between the global mean sunspot number and the Earth's temperature though very weak and statistically insignificant. It is thus concluded that the direct impact of sunspots on Earth's anomaly is very weak, minimal and at best, indirect.

Keywords: Climate, Temperature anomalies, Sunspot, Photosphere, greenhouse emission, global warming, sun irradiance**.**

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ASSESSMENT OF BIOCLIMATIC PRICIPLES IN THE DESIGN OF PUBLIC SPACES IN MINNA

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In the design of buildings for the past few decades, Architects have made attempts to develop or create strategies where human requirement and the building as a whole can adapt to the design of such buildings. Apart from building materials which these building enclosure are composed of, other factors like orientation have also been used to achieve a sustainable built environment. Other methods employed include the development of buildings Bioclimatic charts because different regions have different kinds of strategies adopted by them respectively. Bioclimatic architecture deals with the connection of a building to nature, how building takes into account the climate and environmental conditions to favour comfort within the buildings. The aim of this paper is to adopt the building Bioclimatic principles in order to assess the most appropriate building design strategies for office buildings in Minna. These will be achieved by assessing office buildings mainly within Minna city to find out the environmental impact associated with the buildings due to climatic change. The paper proves that, in a long term, Bioclimatic Architecture is profitable, Architects and the society need to be aware that in order to achieve the desired Sustainability, we need to respect the environment and the changes that occur in the climate, so that we can build based on these bioclimatic principles.

KEYWORD: Built Environment, Office Buildings, Bioclimatic, Sustainability.

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REVIEW AND DEVELOPMENT OF AN ALGORITHM FOR CARBON DIOXIDE EMISSION MONITOR IN AUTOMOBILE

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This work intends to develop an emission monitor in automobile; the work comes up with an advanced and dynamic way of evaluating and capturing the amount of carbon credit deposit in the atmosphere. The impact of global warming, climate change has become a contending issue in most global forum, and it is always at the front burner, ever since most Countries signed up the Kyoto Protocol. Researchers have been trying to see how best carbon can be captured in the atmosphere; this work comes up with a new paradigm which is geared towards developing of a pollutant emission monitor in automobile.

Keywords: Carbon dioxide(CO_2), emission, automobile, analogue to digital converter, sensor, microcontroller

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SUSTAINABLE BUILT ENVIRONMENT AND CLIMATE CHANGE; THE PLACE OF NEIGHBOURHOOD SECURITY AND EFFECTIVE PROPERTY MANAGEMENT IN NEIGHBOURHOODS OF BIDA, NIGER STATE

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In Man's quest and pursuit for agricultural, socio-economic welfare and general physical development on land space, he has so much altered nature and natural resources. This is why the concept of sustainable development was established with its attendant strategies to ensure human and physical development which will be in conformity to the demands for the protection of our fragile environment. In essence, sustainable development is a process by which the exploitation of natural resources and the present means of achieving development do not reduce or limit the potentials for meeting the needs of future generations. Sustainable development placed emphasis on some target areas of the environment including infrastructural development, security, housing, agricultural development, tackling climatic change among others. The agenda with all these trusts is considered laudable and promising enough to produce a change that Nigerians need. However, the effectiveness of sustainable development may be hindered if adequate attention is not giving to urban neighbourhood security. It is on this backdrop that this study attempts to examine the place of neighbourhood security with emphasis on effective property management in achieving sustainable development and liveable environment. Four neighbourhoods in Bida were selected as case study with the view of making a general deduction of the state of security in the community. The four neighbourhoods were selected using a stratified sampling method; were Bida urban area was divided into wards out of which two wards were picked at random and two neighbourhoods were also selected from each ward at random without any form of bias. The four neighbourhoods selected include Masalaci Bologi and Efu Mayaki (Mayaki Ndajiya ward) while, Banin Bida and Laruta neighbourhoods were selected from Umaru Majigi I. 50% of the compounds in each neighbourhoods were sampled using random sampling method were every 3rd compound was picked for sampling. The variables examined in the study are; building condition, sanitary condition, record of health cases, access to portable water, accessibility and security. It was discovered through the study that poor neighbourhood property management could lead to emergence of neighbourhood slum, poor economic productivity, pollution, outbreak of epidemic diseases, insurgence of social disturbance among others. At the close of the study the following recommendations were advanced; rehabilitation of urban neighbourhoods, provision of community infrastructures, orientation of the public on the dangers of climate change and importance of property management among urban neighbourhood dwellers.

Keywords: Rehabilitation, Property Management, Neighbourhoods, Urban dwellers

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STRATOSPHERIC OZONE VARIABILITY: AN IMPLICATION FOR CLIMATE CHANGE OVER SOME SELECTECTED STATIONS IN NORTHERN NIGERIA

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The sun is the major source of energy that drives the entire atmospheric processes. The insolation from the sun is responsible for the wind pattern experienced on earth. The harmful part of the radiation from the sun is shielded from the earth by two layers namely; the stratospheric ozone and the tropospheric ozone. In this paper, a study of the statistical analysis of total ozone concentration as released by Earth Probe Total Ozone Mapping Spectrometer (EPTOMS Satellite) was used to get the total ozone variability in some selected stations in northern Nigeria. The annual coefficient of relative variability (ACRV) of ozone at these stations over a period of 72 months from January 2009 to December 2014 was carried out. The climate variables of average annual temperature and rainfall for this stations were obtained from the Nigerian Meteorological Agency (NIMET) office in Oshodi, Lagos. The climatological station used for the study include; Yelwa, Sokoto,Zamfara, Katsina,Kano,Dutse,Damaturu and Maiduguri. The results of the findings showed that there was a variation in the average value of stratospheric ozone between 4.2% and 6.8%.A strong positive correlation of 0.92 was observed between the ACRV of ozone and average annual temperature, which increased from 12°C at Kebbi to 25% at the hot arid north of Maiduguri. Also a negative correlation of -0.32 was observed between the ACRV of ozone and the average annual precipitation over the region which varied from an average of 718.4mm to 1053.7mm. Maximum ozone inter-annual variability of between 6% and 10% occurred between December and March, coinciding with the dry Harmattan season, while the minimum of between 2% and 4% occurred between June and September coinciding with the raining season. The findings of this study reveals that the higher temperature characterize of the study area could be accounted for by the ACRV. This variability of ozone if properly monitored will assist in the prediction of rainfall and temperature variability as the thermal processes observed in the atmosphere is responsible for the convective activities. It will also serve as a good tool for the monitoring of climate variability in the zone

Keywords: Variability, Harmattan, Climatological Stations, Meterology.

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CLIMATE CHANGE, THE SEGREGATIONAL APPLICATION: THE GWAGWALADA EXPERIENCE

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The conflict between the rich and the poor continue to dominate verbal engagements, especially when laws and its application come into play. It will be unreasonable to continue to discuss sustainability and Climate Change seeking the fragmented views of the public and how they can be equitably addressed. Globally, the phenomenon called sustainability often drag climate change to its discussion table. What should be done and what should not be done have gradually shaped the way and manner man exists in the current shape of living. Now the burden created by the phrase, sustainable development and the quest to appreciate this and bring it to reality is still a mirage to many. Man being so conscious of life and how to better life is continually seeking ways to improve life. There is another phenomenon Green Building or Going Green canvassed but the mega structures around Nigeria do not adopt them. This paper will be considering how the law favour the rich and powerful as opposed to the poor and weak. This paper aims at having a general study of climate change and the segregational state of affairs in Gwagwalada area of FCT Nigeria. Primary and secondary data sources shall be applied in data collection. The primary sources shall involve information from the net, text books and library. The research will come up with the findings that proper categorization and sizing of plots can help in sustainability and slow the rate of climate change.

Keywords: density, landuse, climate change, sustainability, density.

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SUSTAINABLE MATERIALS

EFFECTS OF PALM KERNEL SHELL AS COARSE AGGREGATE REPLACEMENT ON STRENGTH PROPERTIES OF CONCRETE

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Palm kernel shells (PKS) processed free of fibres were used as coarse aggregate replacement in concrete to determine the effects on compressive and flexural strengths, and modulus of rupture at a free water/cement (w/c) ratio of 0.35. Though the compressive strength of all the specimens containing PKS were less than the control at all the test ages, at 28 and 90 days specimens containing 5% PKS had compressive strength that were comparable to the control. The results show that split tensile strength of specimens with 10% PKS content were higher than the control at 7, 28 and 90 days, however compared to the control the modulus of rupture reduced in beam specimens containing PKS.

Keywords: Palm Kernel Shell, Concrete, Modulus of Rupture

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EFFECTS OF WASTE BURNT BRICK POWDER ON STRENGTH OF CONCRETE

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The effects of partial Portland cement replacement with waste burnt brick powder (WBBP) by mass on compressive and split tensile strength of concrete specimens at different ages were carried out at free water/cement (w/c) ratio of 0.35 and 0.40 using two concrete mixes with different cement contents. The effects of WBBP on properties of cement paste at standard consistence were also carried out. WBBP significantly affected initial and final setting times and as well as the water demand in cement. The results of the study shows that strength reductions were recorded for specimens containing WBBP compared to control at all the test days. The lowest strength losses were recorded at lower free w/c ratio mixes for both concrete mixes. The maximum strength recorded for all the test specimens containing WBBP for both mixes was at 10% WBBP content.

Keywords: Waste, Burnt Brick, Control

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Abalaka et. al.(2016). **EFFECTS OF WASTE BURNT BRICK POWDER ON STRENGTH OF CONCRETE** Sustainable Built Environment and Climate change; The challenges of Post 2015 Development Agenda. School of Environmental Technology Conference, SETIC, 2016

INFLUENCE OF OIL PALM PLANTATION AGE AND HYDROLOGY ON DISSOLVED ORGANIC CARBON CONCENTRATION OF MALAYSIAN TROPICAL PEATLAND WATER RESOURCES

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Due to boom recorded globally in oil palm industries, many palm oil producing countries like Malaysia and Indonesia converted the sizeable parts of their carbon-rich previously stable peat swamp forests to oil palm plantation. This conversion resulted in huge loss of the soil carbon in dissolved and gaseous forms to atmospheric body and nearby streams. This paper thus focuses on assessing the influence of oil palm plantation age and hydrological factors on dissolved organic carbon concentration in the tropical peatlands. Four different plantations were considered with different years of peat swamp forest conversion ranging from 2000, 2002, 2006 and 2010. The plantation tagged 2010 was first cleared in 1978 and hereby referred to as 2010/1978 in this study. Two tube wells were installed in each of the plantations for monitoring DOC concentration of groundwater between September 2013 and December, 2014. The results showed positive influence of heavy storm events on DOC concentrations and that the lowest DOC concentration ranging from 18.10 mg/L to 28.60mg/L was observed at 2010/1978 plantation as against the highest DOC concentration of range 169.2 mg/L to 250.50 mg/L at 2000 plantation. The results therefore justify the influence of age of plantation as 1978/2010 plantation recorded the lowest DOC concentration as against the 2000 plantation recording the highest DOC concentration. It is thus recommended that oil palm cultivation on peatlands should be avoided as this practice, if not well-managed, leads to flux and emission of stored soil carbon in both dissolved and gaseous forms to the surrounding water resources and atmospheric body.

Keywords: oil palm plantation, peat swamp forest, dissolved organic carbon, tropical peatland

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PARTICLE SIZE DISTRIBUTION METHODS AS ADOPTED FOR DIFFERENT MATERIALS

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Information on particle size, shape, porosity and pore distribution of constituent materials are very important for choice and their appropriate use in construction. The known methods available for particle size distribution (PSD) are appropriate for materials of specific size range, shape, nature and distribution, while improved techniques are emerging with the advent of computer application in construction. Analysis of materials of varied grain sizes, shape, nature done by three methods of PSD (mechanical sieving, laser diffraction and CT-scanning) were reported in this paper for an assessment of their appropriateness and effectiveness for specific material. The study revealed mechanical sieving has effective for granular materials of 45 µm to 125 mm size range, but the laser diffraction is noted to be suitable for materials of fine particles but gives inadequate results when adopted for very fine materials susceptible to particle agglomeration. The CT- scanning on the other hand is noted to be adequate for PSD analysis of materials having medium to coarse size classification giving more definitive data on actual shape, distribution and volume of the material's particle. CT-scanning also gave results that are comparable to the laser PSD analysis when adopted for finer materials. The study concludes that required details and specific characteristics of the materials of concern should govern the choice PSD methods and a call is made for good knowledge of available techniques by operators and investments on digital and recent equipment by our Institutions for improved outputs in materials research.

Keywords: particle size distribution, mechanical sieving, image analysis, CT-scanning and concrete constituent materials.

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RECYCLING OF DECONSTRUCTED BUILDING MATERIALS FROM SELECTED URBAN RENEWAL AND RENOVATION PROJECTS IN MINNA, NIGER STATE

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Deconstruction involves the process employed to disassemble the existing building structures such that it can be reused or recycled. 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. The resultant effect is great economic loss, damage and more worryingly generation of significant waste and lots of debris to the built environment. Selected urban renewal and renovation sites were examined to find out the techniques employed in removing whole or parts of such existing structures allow for effective reuse or recycling. The study employed the case study survey and descriptive research methods. Data were collected by means of structured observation schedules and interviews. The findings further demonstrated that 75% of sites lacked technical know-how while 87% deployed unsuitable equipment during the construction process. The study recommended that there is need for the engagement of deconstruction experts and specialists in order to ensure proper deployment of appropriate tools in carrying out the work. The research further recommended that Greater partnership between construction industries and recycling factories should also be encouraged. The study concluded that more emphasis was given to the economic benefits of Deconstruction over its sustainable benefit.

Keywords:
Building components, deconstruction, recycle, reuse, salvage, waste

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POTENTIAL OF COMPRESSED EARTH BLOCKS FOR LARGE SCALE AFFORDABLE HOUSING DEVELOPMENT IN NIGERIA

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The use of Compressed Earth Blocks for housing construction is at its infancy in Nigeria. This is as compared to many developing and developed countries where it is utilised in several other components of the building such as foundation, cladding and roofing. The paper discusses the housing challenges of Nigeria, earth application types and techniques, the prospects and innovations in Compressed Earth Block as an affordable building material as applied in various components of the housing units and lastly the its advantages and limitations. Local and international Case studies of buildings were reviewed. These confirmed that Compressed Earth Blocks has great advantage over most contemporary building materials; it is cost effective and can be well applied in the production of components such as roofing, walling and flooring. The paper concludes that Compressed Earth Blocks (CEB) if appropriately applied will significantly reduce the cost of construction, facilitate the development of environmentally friendly and sustainable housing that would help to ameliorate housing challenges and the negative effects of climate change.

Keywords: Compressed Stabilised Earth; Housing Development, Sustainable Built Environment

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COMPRESSED EARTH BRICKS FOR SUSTAINABLE BUILT ENVIRONMENT IN NIGERIA

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Until very recently, the Compressed Earth Bricks building material has registered low patronage and acceptability in Nigeria. The paper analysed sustainability concepts and features to the built environment; sustainability and housing provision; features of sustainable building materials and the properties of Compressed Stabilised Earth Bricks as a sustainable building material. It also assessed the degree of awareness and application of Compressed Earth Bricks by some selected professionals in the Building Industry and its sustainability as a building material. Descriptive survey designs were used, through the application of review of related literatures, questionnaires, interview and personal observation methods of data collection. The instruments were applied to designers/professionals in the building industry in Kaduna state, Nigeria. The findings of the research are that there is high level of awareness but low level of use of Compressed Stabilised Earth for building construction. Secondly 41% of 27 respondents strongly agreed that Compressed Earth Brick is a sustainable building material while the rest of them simply agrees that it is economical, environmental and socio-cultural sustainable. If the professionals in the building industry will utilise CEB in their projects; masses are well educated and enlightened on the viability and sustainability of Compressed Earth Brick building material, more people will embrace and apply it for their construction and thereby eliminating the negative impact of other building materials on the built environment and climate.

Keywords: Awareness, Knowledge, Compressed Stabilised Earth; Sustainable Built Environment and Sustainability.

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CROSS CUTTING ISSUES

3D MODELING OF STRUCTURES USING TERRESTRIAL LASER SCANNING TECHNIQUE: Case Study Faculty Of Engineering, University Of Lagos

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Corridor and internal mapping is almost impossible with the fastest means of survey, there is a need for a system that can capture object geometry in 3D in a direct, rapid and detailed manner; also with the possibility to survey remotely very complex, inaccessible and hazardous objects and areas, where the traditional techniques are either incompetent or slow. The laser scanning technology provides multipurpose use of the data, both currently and for future use, with the completeness and comprehensiveness of scanning. "Everything" in the scene is captured at once without a need for lighting for data acquisition. Therefore, the user does not need not return to the site if some new data is needed leading a dramatic reduction in costs and much faster project completion. Coverage of the whole object is achieved through scanning, by means of an opto-mechanical scanner, in both horizontal and vertical directions, at the rates of thousands to several hundreds of thousands of points per second, depending on the ranging approach employed. The output of this process is a highly detailed 3D image of the object, typically consisting of millions of densely spaced points, called "point cloud". The aim of the project was to develop a 3D model of some parts of the faculty of Engineering, University of Lagos using the Laser scanning technology. The field work entailed the use of a Leica TS06 total station instrument to coordinate 32 survey control points serving as stations on which the laser scan station 2 instrument was set. The reflector less Total station was used to get the coordinates of some points for georeferencing and checking points for the distance comparison analysis. The Leica scan station 2 was used to acquire fine scans, images and acquire targets from fence at each station. The scans where done at 150mm horizontal point spacing by 150mm vertical point spacing. Leica Cyclone 7.0.software designed for the Scan station 2 was used to carry out the scans, image, registration, meshing and animation. The results showed that 3D models of structures can be modelled and also, the point cloud coordinate are about the same as total station survey. Also, queried distances on object have been found to be the same with the measurements obtained from using the linen tape. The research concludes 3D terrestrial laser scanning has been shown to be a very effective and time efficient technology for data capture. The time spent on the field is much shorter with greater data acquired than regular survey methods. When also likened to close range photogrammetry, the time spent on data processing makes terrestrial laser scanning more efficient.

Keywords: Modelling, Scan station, Cyclone, Point Cloud, Scan world

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ASSESSMENT OF INSECURITY CHALLENGES IN NYANYA AREA OF ABUJA, NIGERIA

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Insecurity is a major phenomenon plaguing many regions in Nigeria. However, the situation is more intensified in the northern part of the country where Boko-Haram insurgency has thrived unabated. Insecurity is not only caused by a single factor but a combination of factors such as armed robbery, burglary (house and shops), terrorism, cult activities, among others. The aim of this study is to assess the incidence of insecurity and its effect on residents of Nyanya, Abuja. Nyanya has 40232 households, 10% of the households population where used to carry out this study using multi-stage systematic random sampling method Nyanya was divided into six (6) neighbourhoods and questionnaire where distributed according to the number of household in the neighbourhood. The study discovered that Nyanya has 51.4% of armed robbery occurrence on monthly basis, 41.2% incidence of shop burglary on daily basis, 30.4% incidence of house burglary on weekly basis, 55.8% cases of false pretence on daily basis and 51.4% occurrences of unlawful possession on daily basis; and these crimes are mostly caused by unemployment and under-employment, poverty, low and lack of formal education, lesser penalty for offenders, lack of parental care, peer pressure, poor social amenities among others. However, as risen the level of insecurity and fear in Nyanya from 30.6% in 2013 to 67.4% in 2015. In view of these, many crime prevention measures have been taken by the residents and the government among which are effective police patrol, several military check points, and restriction of movement. The research therefore recommended that Government should strengthen its security forces in areas like the Nyanya village, Nyanya market area and Mararaba junctions respectively to reduce the level of crime occurrence and there should be a joint security service between the government security and the resident's security providers to help contain crime activities in the area.

Keywords: Insecurity, Security, Crime, Safety, Fear, Terrorism.

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ASSESSMENT OF THE EFFECT OF COMMUNAL CONFLICTS ON RESIDENTIAL SEGREGATION IN KADUNA METROPOLIS, KADUNA STATE, NIGERIA

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This research focuses on the assessment of the effect of communal conflict on residential segregation in Kaduna metropolis, Kaduna State Nigeria. It assesses the socio-spatial and economic characteristics of the residents and their pattern of intra-city movement. The study also assessed the role of physical planning agencies responsible for physical development in the study area. To obtain field data required, 390 (2.5%) households out of 15,378 existing in the study area were selected using stratified simple random sampling technique. Four settlements; one in each of the four local government areas that made up the metropolis out of the 33 settlements were selected using a simple random technique they are: Narayi-bayan dutse in Chikun, Unguwan Muazu in Kaduna south, Rafin guza in Kaduna north, and Hayin naiya in Igabi Local Government Area. The research showed that there was a significant movement of residents who changed location within the metropolis due to communal conflict; this resulted in ethnic and religious segregation, such that Kaduna north, accommodates about 75% Hausas and other tribes whom are 90% Muslims and Kaduna south accommodates people from southern Kaduna origin, Igbo, Yoruba and other tribes; 73.02%, 7.14%, 1.11% and 8.13% respectively, constituting 91.05% Christians. Unguwan Muazu exhibits an element of coexistence among the various ethnic groups; Hausas, southern Kaduna, Yoruba, Igbo and other tribes: 48.83%, 12.68%, 32.39%, 4.2% and 1.88% respectively. The study shows that people can still coexist, given the right atmosphere and through concerted planning efforts and enlightenment. The study, therefore, recommends a framework for planning and controlling the physical development in Kaduna metropolis and the inclusion of residents in planning decision making for sustainable development.

KEYWORDS: Communal Conflict, Economic Characteristics, Intra-City Movement, Residential Segregation and Socio-spatial.

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TENURE SECURITY DUE TO UNRESOLVED RESIDENTIAL LAND DISPUTES IN KADUNA: CHALLENGES AND WAY FORWARD

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Maladministration of urban land, urbanization, population growth, and many other factors are causing numerous land disputes over allocated residential plots within Kaduna Metropolis thereby posing serious tenure security threats to statutory title holders. This study used survey research design to ascertain how tenure security of statutory land title holder were threatened by many unresolved land disputes at four (4) selected residential layouts within the metropolis namely; Kinkinau, Mahuta, Unguwan Dosa and Unguwan Boro layouts. The population of the study includes 3,970 statutory title holders of residential lands; 87 senior technical staff of Kaduna State Lands Ministry; 38 professional lawyers and 48 Estate Surveyors and Valuers dealing with the Ministry. 100 statutory right of occupancy holders were administered questionnaires at each at the four selected layouts. The study revealed that fraudulent practices of Kaduna State Ministry of Lands officials, land touts and agents had caused land disputes threatening the tenure security many statutory title holders to lose the huge funds they paid to purchase their residential lands. The study concluded that there exist serious threats to tenure security of holders of statutory titles over residential plots within Kaduna metropolis. The state Government should as a matter of urgency set up a task force to include civil society groups, law enforcement agents, lawyers, land experts and members of staff of Kaduna State Lands Ministry to curb the menace of touts, agents and fraudulent staff of the Lands Ministry.

Key Words: Land dispute, tenure security, land allocation, dispute resolution.

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DESIGN CONSIDERATION FOR CROWD CONTROL IN RELIGIOUS BUILDINGS: A CASE STUDY OF MOSQUE BUILDINGS IN NIGER STATE, NIGERIA

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It has been observed overtime that problems occur when a large crowd of pedestrians are trying to move in or out of places of gatherings especially sporting, religious, cultural and other crowd intensive events. These problems are due to lack of crowd control considerations in terms of design, information technology and management to adequately control crowd situations. In Mosque for instance, at peak periods on Fridays and Eid days, crowd control is a problem especially after the prayers when people are trying to find their ways out of the mosque premises. Therefore, the importance of the design consideration for crowd control in mosques and other such buildings cannot be over-emphasized. As a result, this paper aims to evaluate the openings (ingress and exits) as a design consideration for crowd control in selected mosques in Niger state. Secondary source was used to gather relevant information, and an observation schedule was also used as a research instrument to get important field data. Data gathered on the type, size (width) and direction of swing of the door openings were analysed and presented in form of tables and chart. The findings show that 100% of the door used in the research areas are single swing door. Similarly, 100% of these doors swing to the direction of exit.

Key-words:Crowd-Control, Design-Consideration, Friday, Mosque, Muslims, Pedestrian, Prayers.

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EVALUATION OF USER SATISFACTION IN SELECTED STUDENTS HALLS OF RESIDENCE, UNIVERSITY OF IBADAN, NIGERIA

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The study evaluated the physical qualities and satisfaction in students' housing in selected Students' halls of the University of Ibadan. Through survey method, eight hostels were purposively selected to capture variation in gender, level of study and hostel design. The sampling frame showed that 5605 students at UI were found in 2,147 rooms. One out of every 10 (10%) of the rooms were selected which amounted to 215 students selected. The result shows that the functional qualities of the hostels were perceived among the students to be well above average (55.3%). Similarly, both aesthetics (95.8%) and structural (89.3%) qualities of the hostels were perceived to be excellent among the students. Also, respondents were satisfied with various services and amenities provided in the Halls of Residence (54.4%) and 35.3% expressed neutral satisfaction. The study concluded that, Physical qualities and Satisfaction are important in the study of Students' Housing Design.

Keywords: Physical quality, Satisfaction, Students' Housing, University

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THE ADEQUACY OF RELAXATION SPACES FOR STUDENTS IN SELECTED FACULTY BUILDINGS IN NIGER STATE

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With concerted efforts geared towards the campaign for increased youth literacy and education around Nigeria, there has been a significant boom in the population of students in many of the country's tertiary institutions. This has lead to an overload of scarce resources, overcrowding and pressure on the urban-environmental equation to the detriment of the students. The importance of a student's mental health in an institution is usually downplayed in the Nigerian educational system in favour of physical wellbeing- it is hardly even mentioned in publications. Consequently, the provisions of relaxation spaces are not high priority to designers of Educational institutions. Open relaxation spaces within and around faculty buildings will go help to provide a controlled environment for student rest and meaningful social interactions. The aim of this paper is to assess the provision of open-air relaxation spaces in faculty buildings in Niger state. It seeks to assess the adequacy of the spaces provided. A combination of the Post-occupancy evaluation (POE) and descriptive approaches will be used to determine the adequacy of the open spaces provided in faculty buildings student relaxation, the end-user perception of the satisfaction derived and the importance of open spaces in saving energy. A total of 10 faculty buildings in 6 higher institutions across the state were chosen with selective bias as study areas. Questionnaires were administered to 150 students from these institutions. The data will be analysed using SPSS analytical tool and presented in tables and charts. Results will reveal a pattern of dissatisfaction from majority of the students in the faculties investigated and that students generally craved more open green areas to help them relax.

Keywords: adequacy, faculty buildings, open relaxation spaces, mental health, satisfaction.

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INTEGRATION OF OUTDOOR RELAXATION SPACES IN HOSPITAL BUILDINGS IN ABUJA FOR STAFF SATISFACTION

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Relaxation can be said to be any type of activity carried out by a person for the purpose of relieving stress. These activities which range from physical to mental could be carried out indoors or outdoors. Hospitals are a place where the nature of the activities results in stress for staff hence requiring a place to relax within the hospital environment. The provision of outdoor relaxation spaces in hospitals for staff has not been the focus of hospital designers in combating stress and coping with climate change within hospital environment in Abuja city. The aim of this paper is to examine how the relaxation spaces outside the hospital can help staff cope with climate change challenges in the hospital while relaxing. The research method adopted for this study is a combination of method with the use of questionnaire and physical observation of the relaxation areas in hospitals to see how spaces are used. The data obtained with the aid of Statistical Package for Social Scientists (SPSS) for analysis and the results presented in charts and tables. The results would reveal that outdoor relaxation areas in hospitals for staff is of great importance and that the elements used would help reduce the heat gain around the building. In conclusion the paper would recommend how the design of hospitals could be achieved to include outdoor relaxation area that are environmentally friendly.

Keywords: climate, hospital, outdoor, relaxation, spaces, staff.

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ASSESSMENT OF PASSIVE SECURITY DESIGN CONSIDERATIONS IN SHOPPING COMPLEXES IN MINNA, NIGER STATE.

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The Security implications of climate change impacts are far reaching, as they may increase the severity of existing stressors, political instability environmental degradation, and contributing to poverty, providing enabling environments for terrorist activity in the country. Nowadays, shopping complexes are largely used in so many different applications for the convenience and ease of use by operator. The storage, exchange of goods and services within complexes require high security measures. Maintenance of high level security is therefore an utmost priority for the designers. The current security practices do not provide sufficient protection to support building sustainability in the event of terrorist act. This paper is therefore set out to assess the status of passive security measures shopping complex buildings, comparing existing passive security measures with standard practices, suggesting functional solutions for sustainable environment. The study employed the use of Descriptive Survey method on sample size of 4 shopping complexes in the selected areas which is approximately 24% of the total sampling frame of 17.The primary data was obtained by means of direct observation schedule from the selected research areas. The secondary data was obtained from related journals, books and seminar papers. The data obtained were analyzed with simple descriptive statistics. This research revealed that most of the shopping complexes are vulnerable to security threats within the research areas. Some shopping complexes with inadequate security measures command security threats with relatively lower rental values and exchange of goods and services than some with availability of security measures. This research recommended that government by way of Public Private Partnership should embark on adequate implementation of passive security measures at the design stage of shopping complexes to improve property value and social life within the study areas.

Keywords: Public buildings, Security measures, Security threats, Shopping complex, Sustainability

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ASSESSMENT OF EXPLOSION PROTECTION MEASURES IN COMMERCIAL COMPLEXES IN ABUJA, NIGERIA

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The rise and spread of terrorist activities around the world, with Nigeria featuring prominently among the countries with most astounding human casualties and building destructions, has become a worrisome trend now occupying defensive thinking, militarily. But lately, Abuja, the capital city of Nigeria has had a series of explosive attacks with the utilization of Improvised Explosive Devices in parked or penetrative suicidal vehicular operations with varying degrees of decimations, which calls for the occupation of our defensive thinking as well, architecturally. Commercial complexes happen to fit into the considerations necessitating the need for their protection to mitigate terrorist attacks and ensure building survivability and safety of occupants. This paper set out to assess the blast resistance measures (defensive levels) in commercial complexes in order to come up with protective architectural design methods for new buildings or retrofit methods for existing structures to make them blast resistant buildings. This study utilized primary and secondary data sources. The primary data sources incorporated the utilization of observation schedules in field work, which were analyzed utilizing the SPSS software and the results exported to Microsoft Excel to produce pie charts to determine percentages of the imputed data. The paper studied the generation and reflection of blast wave, which is the chief damage mechanism in an explosion, to understand its behavior. It also used studies of building forms in terms of geometric shapes of buildings and some elements of the building envelope, and use of materials to exploit their energy absorption/reflection capabilities. As part of sustainable design, the effectiveness of the use of plants to reduce blast load impact is presented. The key finding is that the commercial buildings in Abuja are not architecturally in conformity with explosion protection designs and therefore need to be retrofitted to make them blast resistant.

Keywords: Terrorism; Explosion; Commercial Complexes; Blast Resistant Buildings; Building Form

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THE SOCIO-CULTURAL EFFECT OF CHANGING FROM TRADITIONAL TO MODERN ARCHITECTURE IN NIGERIA, 1915- 2015

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Traditional ways of building houses have been the order of the day since 1915 - 1950 in the history of Nigerian architecture. Through this period of traditional housing provision, Nigerians with the use of locally sourced building materials have devised a traditional method of self-help whereby people came together with the spirit of mutual co-operation and communal participation to help others to acquire houses of their own at affordable prices or little cost. Modern architecture appeared in Nigeria from 1950 to date as a result of European influence that geared the interest of many Nigerians to copy such style of architecture. This modern style brought rapid increase of urban and rural development but also has its numerous effects in Nigerian architecture such as: fading away of housing identity, loss of traditional architecture, unaffordable housing for the poor, loss of socio-cultural environment and environmental degradation. This paper x-rays the socio-cultural effects of changing from the traditional to modern buildings and proffers ways of encouraging traditional architecture. It suggests that Architects in Nigeria should design houses taking into cognisance the culture and lifestyle of the people through the use of traditional materials.

Keywords: affordable, architecture, hybrid, modern, traditional

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RESIDENTS' INTRA-URBAN MOBILE PHONE USAGE AND TRAVEL DEMAND IN SOMOLU LOCAL GOVERNMENT AREA, LAGOS, NIGERIA

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This paper examined the effect of intra-urban mobile phone usage on travel demands of residents in Somolu Local Government Area, Lagos, Nigeria, with a view to reducing traffic on the road. This study examined the socio-economic characteristics of residents in the study area, residents mobile phone usage, residents travel pattern and the relationship between mobile phones usage and travel demand in the study area. A set of structured questionnaire were administered on 178 residents of selected wards in the study area. Systematic sampling technique was used for the study. Data were analyzed using frequency tables, chart, cross tabulation and Pearson product moment correlation coefficient. The study revealed that 30.9% of respondents received less than 10 calls per day while 27.0% respondents made an average calls of 11 - 20 times per day. Besides, 52.8% of respondents spent between N101-N500 on calls per day. The average travel distance of respondents was 10 km and the average travel cost was between N101-N500 per day. The major travel purposes of respondents were official assignment and visitations (38.2%). The study also established that 42.7% of respondents travel mode was through public transit while 52.4% of respondents spent less than 1 hour on trips per day. The average appointment cancelled as a result of mobile phone call was < 5 while trip completed as a result was also < 5 times per day. Also, trip induced was < 5 per day. There was a significant positive correlation between the respondents' received calls and appointment cancelled ($n=178$, $p> 0.01$, $r=0.480$). This suggests that as respondents received calls, the appointment cancelled increases per day. There was a positive relationship between respondents' calls frequency and number of trips completed per day ($n=178$, $p< 0.05$, $r=0.194$). Also, calls frequency by the respondents and travel induced ($n=178$, $p> 0.01$, $r=0.204$). The study recommends that services from network provider should be monitored in order to ensure that reliable and efficient services are made available to subscribers in order to further discourage physical travels which lead to intra-urban traffic delay on daily basis.

Keywords: Residents, Intra-Urban, Mobile Phone Usage, Travel Demands

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THEORETICAL EVALUATION OF ART ELEMENTS AND THE RELATIONSHIPS WITH DESIGN ACTIVITIES IN ARCHITECTURE

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Drawing is an essential tool of creativity for architects in the process of documenting imagination, information or ideas in paper for further development. Art elements such as line, shapes, and forms are channels for developing concepts which culminates into an effective presentation of architectural design. It is obvious that the importance of art in design cannot be over emphasized, but the application of these elements of art to achieve a desirable result in design is not well understood by many students of Architecture, most times it is misapplied. The paper is based on literature review as well as 26 years of autoethnographic transactions with students of architecture. It has been observed that students are unable to translate ideas through drawing into design proper. And as such this paper looks into the process of using elements of art as a panacea for solving design problems in architecture. It further goes on to explains how these elements of art can be manipulated by architecture students to produce a pragmatic design.

KEY WORDS: Elements of Art, Design Activities, Creativity and Architecture

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REVIEW OF EFFECTS OF VARIATION ORDER ON TOTAL COST AND SCHEDULE IN REFURBISHMENT PROJECTS

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It is common phenomenon that all construction activities associated with the maintenance and refurbishment projects are often fraught with exceptional risks and uncertainties from inception through completion, irrespective of size or location. These risks can be predictable or completely unforeseeable whereas some emerge from large number of variation orders. Variation to original works simply implies that it is impossible to know in advance every issue or challenge that will be encountered once works began. The only guarantee before actual works began is that unplanned items during the refurbishment works will be discovered. Hence, even the best pre-construction planning may only reduce the number and complexity of the unplanned items but not eliminating them completely. The uncertain nature of refurbishment therefore, means that the risks and uncertainty must be managed and mitigated rather than ignored. This paper seeks to explore the impact of variation orders on refurbishment project. The paper is based on comprehensive literature review supported by semi-structured interviews. The paper establishes a consensus that the most likely solution to counter variation to original works is to design an appropriate contingency modelling which should inform the build-up of contract sum in refurbishment contracts.

Keywords: Refurbishment, risk, uncertainty, variation

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EXPANDED POLYSTYRENE (EPS) AS SUBSTITUTE FOR TRADITIONAL FASCIA MATERIALS.

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Timber and reinforced concrete have been used for the construction of fascia for buildings over the years. However, these conventional materials have their shortcomings hence, the need for better materials. One of such materials is expanded polystyrene (EPS). This research therefore focused on the evaluation of the properties of expanded polystyrene with the view of using it as a substitute for the traditional materials as fascia. Company standards of expanded polystyrene was obtained and compared with those of timber and concrete. Also laboratory tests were carried out to ascertain the effects of moisture on weight, cost benefit analysis and construction requirements were evaluated for the three materials. The susceptibility of the materials to fire was evaluated. It was found that, the cost of constructing reinforced concrete fascia is 46% higher than EPS fascia of comparable size. Also, timber gains 16.67% increase in weight when exposed to moisture while EPS gained only 7.69%. In terms of fire resistance, timber has the least tolerance with a temperature range of 140-180°C followed by EPS with 180-210°C while concrete ranges between 300-650°C. However EPS is normally installed with a concrete cover on the inner phase thereby utilizing the fire resistance of concrete on that face. Thus, expanded polystyrene is an excellent replacement for timber and concrete (conventional materials) in fascia construction.

Keywords: *Expanded Polystyrene; Fascia*; *Reinforced Concrete; Timber;*

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ASSESSMENT OF THE AVAILABILITY OF LANDSCAPE ELEMENTS IN PUBLIC SECONDARY SCHOOLS IN MINNA NIGER STATE.

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Numerous studies have shown that landscape elements provide a number of health and wellbeing benefit. A common denominator in this is human attachment to nature and how we find identity in landscape. The aim of this paper is to assess the adaptation of landscape elements in public secondary school buildings towards improving the level of attachment to school by user as well as mitigating the effect of climate change for sustainability through the provision of a proper landscape of government secondary school environment in Niger State Minna North Central Nigeria. It was based on the notion that landscape has some benefits on secondary school users. Data was obtained using an observation schedule and a cross section of ten government secondary schools were surveyed in Minna and Chanchaga local government of Niger State. The studies assessed the level of landscape and how attached are users to the environment of government secondary schools in Minna. The conclusion and recommendation highlighted critical areas where attention is needed in order to improve the landscape of government secondary schools in Minna Niger State .

Keywords; climate change, sustainability, landscape elements, secondary schools, availability, users.

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BUILT ENVIRONMENTAL FACTORS ASSOCIATED WITH THE SPREAD OF VECTOR-BORNE DISEASE. THE CASE OF MALARIA IN URBAN AREAS OF NIGERIA.

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Malaria disease is a pandemic that has affected many parts of the world especially the developing countries. Africa as a continent has suffered so much largely because of the built environmental and climatic factors associated with the disease. The effect of climate change which has affected all parts of the world is another contributory factor that aids in the spread of the disease. The study seeks to investigate the built environmental factors that aids in the spread of the disease. Reviews of various literatures that are related to the factors that influences the spread of malaria were searched through some of the literatures database. Over twenty related literatures were reviewed on the built environmental factors and malaria. The results revealed those inadequate infrastructures, poor building conditions, inefficient waste disposal system, poor sanitary system and ignoring the building byelaws during construction all aids in the spread of the malaria. The study recommends that adequate infrastructures should be provided to Nigerian urban centres, there should be efficient waste disposal system and building byelaws must not be ignore during construction.

Keywords:built environment, climate, disposal, malaria, waste

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IMPACT OF A TERTIARY INSTITUTION ON THE INFRASTRUCTURE DEVELOPMENT OF THE HOST COMMUNITY

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Federal university of Technology, Minna developed its main campus in Gidan-Kwano and started operation in 2005. This work examines the impact of university on the host community. Landsat imageries were used to monitor spatial growth in Gidan-Kwano between year 2005 and 2015. Ground survey data were collected from Federal university of Technology, Minna, Estate Agents, Property developers, Power Holding Company of Nigeria and Ministry of Lands and Housing. ILWIS was used to analyse the satellite imageries while Analyze-it was used for the analysis of the ground survey data. Findings revealed that residential land use which stood at 8.87% of the total land use in 2005 has now grown to 25.19% in 2015. There are other infrastructure attracted to the area during period under review. However, the growth has been marked with problems of uncoordinated development and inadequate infrastructure. The ever increasing population of the university will continue to attract physical development and if the growing development is not coordinated by enacting master plan, there will be chaotic and haphazard development. The study has revealed the spillover effects of locating university. It has also unfolded the pending danger of uncontrolled development. A comprehensive master plan should be developed for the community.

Keywords: Impact, University, Residential, Development

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REINVENTING FEDERAL AND STATE INSTITUTIONS FOR EFFECTIVE AND SUSTAINABLE HOUSING DELIVERY IN NIGERIA

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Nigeria which has an estimated population of 150 million faces a massive housing deficit also estimated at 17 million housing units. It was further deduced that an approximate value of 720,000 housing units per annum will be necessary to replenish the decaying housing stock and also meet the rising demands which if implemented will avert a further housing crisis by the year 2020. At N 3.5 million per unit, N 60 trillion will be required to provide the calculated 17 million housing units. This paper reiterates the importance of affordable housing delivery through the combined efforts of various government agencies and research institutions in making this a possibility. It also highlighted the various setbacks that contribute to the current challenges in this sector. The paper finally concluded on the importance of providing a stabilized institutional framework for effective housing delivery and urban management at all tiers of government which requires that all the three tiers of government develop a shared understanding, knowledge and skills to be able to perform the roles assigned to them in the National housing Policy.

Keywords: Decaying, delivery, framework, housing units, policy

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