

1ST INTERNATIONAL CONFERENCE OF ENVIRONMENTAL SCIENCES

ICES 2019

THE PROCEEDINGS OF INTERNATIONAL CONFERENCE OF ENVIRONMENTAL SCIENCES

ICES 2019

EDITORS

L.T. Ajibade

N. B. TANIMOWO

G. AMUDA-YUSUF

N.A. BELLO

Dr. G. Amuda Yusuf



29th – 30th
APRIL,
2019

FACULTY OF ENVIRONMENTAL SCIENCES,
UNIVERSITY OF ILORIN, ILORIN, NIGERIA



ICES2019

INTERNATIONAL CONFERENCE OF ENVIRONMENTAL SCIENCES

COLLABORATION FOR SUSTAINABLE
DEVELOPMENT IN THE BUILT ENVIRONMENT

Editors:

Ajibade, L.T; Tanimowo, N.B, Amuda-Yusuf, G and Bello N.A

Faculty of Environmental Sciences, University of Ilorin, Ilorin, Nigeria

ICES2019

INTERNATIONAL CONFERENCE OF ENVIRONMENTAL SCIENCES - 2019

COLLABORATION FOR SUSTAINABLE DEVELOPMENT IN THE BUILT ENVIRONMENT

ISBN 978 – 978 – 973 – 294 – 4

Publisher

Faculty of Environmental Sciences
University of Ilorin,
Ilorin, Kwara State,
Nigeria.

Typesetting by

Provortex Consultants
(+234) 08035226314, 08035799443

Cover Design & Print

MJY - Press Enterprise
(+234) 08060733309, 08054329767

FOREWORD

It's my privilege and pleasure, on behalf of the Vice Chancellor of this great institution, Prof. Sulyman Agenjolola AbdulKareem, to welcome you all here today. It has been a long journey since the idea of the first *International Conference of Environmental Sciences* (ICES) was mooted. It looks then that we cannot do it, what with many other problems we have to cope with as a very young Faculty.

Being the very first academic outing of our fledgling faculty, we are all aware that it cannot be our best effort. We just needed to start somewhere, hoping that in subsequent years, as we develop capacity, we will continue to build on gains of today. So feel free to tell us areas we can improve upon because in years to come, the goal is to make ICES a flagship biennial national dialogue.

The encouragement for the university administration, particularly our Leader and Vice Chancellor, Prof. Abdulkareem and the doggedness of faculty staff and students have made today a reality. I therefore want to appreciate our Vice-Chancellor and my colleagues in the faculty for making today possible. .

The goal of sustainable development is to meet the needs of today, without compromising the needs of tomorrow. This implies that we cannot continue using current levels of resources as this will not leave enough for future generations. Therefore, stabilising and reducing carbon emissions is key to living within environmental limits as this will create a truly sustainable built environment that is fit for the future.

The theme, *Collaboration for Sustainable Development in the Built Environment*, captures our focus as academia and professional in the larger society and the broader Sustainable Development Goals (SDGs). Beyond that, it gives exciting opportunities to several of our professionals like Quantity Surveyors, Architects, Geologists, Geo informatics, Town Planners, Land Surveyors, Estate Valuers, Engineers etc to express themselves and their activities at ICES.

Collaboration is essential for development in today's world because real life challenges require researches that are multidisciplinary in nature. When you want to control flooding for instance, you need Civil Engineers, Soil Scientists, Geographers, Geologists, even Public Relations Professionals etc for diverse roles.

For robust development of built environment in a sustainable ways, **geographers**, who are concerned with the study of places and relationships between people and their environments; **Surveying and Geo-Informatics Professionals** who are concerned with geo-data and geo-information about locations in relation to the earth and **Urban and Regional Planners** who will develop and design use of land are essential partners.

Furthermore, **Architects** helps with planning, designing, and construction of buildings and any other structures that made up the environment while based on the structural performance of different materials and geometries the **Structural Engineers** design the 'bones and muscles' that create the form and shape of the structures designed by the Architect. **Services Engineers** strive to achieve a safe and comfortable indoor environment whilst minimizing the **environmental impact** of buildings through collaboration with **Chemical Engineers** and other specialists. Then **the Quantity Surveyors**, who are the construction cost experts, will predict and manage construction cost from inception to completion.

So evidently, we must all collaborate to make possible the attainment of Sustainable Development Goals (SDGs). And as if to emphasize the need for collaboration, the drafters of the Seventeen (17) Sustainable Development Goals made goal Seventeenth, perhaps the ultimate goal- partnership for all the previous 16 goals. Besides, the University authorities here have always emphasize multidisciplinary collaboration among researchers.

We are honoured to have Prof. Adeniyi Suleiman Gbadegesin, our Keynote speaker, in our midst this morning. He is a colossus and mentor to many professors of Geography. As an international scholar of repute with wide and varied experience, this gathering will benefit immensely from his paper.

Similarly, we have with us Prof. Ahmad Doko Ibrahim of the Department of Quantity Surveying and Project Construction Management, Ahmadu Bello University (ABU) Zaria who had done a lot to bring ABU into reckoning. I salute you sir and welcome you heartily.

The 1st International Conference of Environmental Sciences (ICES 2019) received a total of 150 abstract, accepted 72 and today we have a total of 49 full papers to be presented by authors in 6 parallel sessions. Students' competition on the theme of the conference will be conducted to conclude the activities of the conference.

Let me express the warm appreciation of staff and students of this faculty and the entire university to all our professional colleagues who are gracing this occasion in the spirit of town and gown mandate.

"It's therefore my pleasure to extend a cheerful welcome to you all! Your presence makes us very happy."

Thank you for coming

Dr. Ganiyu Amuda-Yusuf
Ag. Dean Faculty of Environmental Sciences

ACKNOWLEDGEMENTS

The First International Conference of Environmental Sciences (ICES 2019) organized by the Faculty of Environmental Sciences, University of Ilorin, Nigeria owes its success to the hard work, commitment and support of individuals both in the academia and the general public. These individuals provided the technical, financial and logistic supports that enable the Faculty realize the objectives of this epoch making academic event.

First, the Local Organizing Committee (LOC) sincerely appreciates the Vice Chancellor of University of Ilorin – Professor Sulyman Age Abdulkareem, who provided huge moral and logistic support for the Faculty to make the conference possible. We are grateful to the Vice Chancellor and the entire University Management for providing accommodation and transport logistics for the Guest Speakers and for the general smooth running of the conference. This singular support demonstrates the commitment of the Vice Chancellor and his Management team to academic excellence which enhances the visibility of University of Ilorin both nationally and internationally.

The LOC is grateful for the dynamic leadership of the Acting Dean of the Faculty of Environmental Sciences – Dr. Ganiyu Amuda-Yusuf, whose vision and relentless efforts saw to the conception, planning and execution of this conference. Your support and encouragement have, in no small measure, assisted in the realization of the objectives of this conference. The support of the Acting Dean of Faculty of Communication and Information Sciences (CIS) – Dr. Jimoh R.G. at the conceptual and implementation stages of the conference is quite commendable. His inputs help crystallize the conference concept notes while the provision of venues for the technical and plenary sessions addressed our logistic needs. We are also grateful to the Dean, Students Affairs – Prof. L.T Ajibade who assisted the LOC in the review of conference papers and in the mobilization of the Students for the conference.

The keynote speakers at this international conference delivered thought provoking papers that served as the conference ice breaker and they have made us proud. We are grateful to Prof. Adeniyi Gbadegeshin, the immediate past Vice Chancellor of Ladoke Akintola University (LAUTECH), Oghomosho and Prof. Ahmad Doko Ibrahim of Ahmadu Bello University for accepting our invitation and for delivering the lead papers for the conference.

We recognize the contributions of Dr. Bolaji Sulieman, the Sub-dean of the Faculty of Environmental Sciences who coordinated conference planning and execution activities on behalf of the Faculty. The secretariat operations of the conference were adequately handled by the Faculty Officer –Mrs. Azeizat Ibrahim. The LOC is grateful to her and other administrative staff of the Faculty for their immense contributions.

At the preparatory stage of this conference, the Faculty reached out to individuals and corporate organizations for financial support. In response, many donated substantial amounts of money which assisted a lot in procuring materials for the conference. The Faculty appreciates the well-meaning individuals and management of all corporate organizations for this kind gesture.

This conference could not have been a success without the dedication and untiring efforts of the LOC and other sub-committees that handled the conference planning and implementation. On behalf of the LOC, I sincerely thank **all those** who served in the LOC and all other sub-committees. I am specifically grateful to the Chairmen of all sub-committees in person of Dr. N.A Bello (Technical Sub- committee); Dr. Maimuna O. Abdulraheem (Logistic Sub-committee); Dr. A.I Bako (Publicity and Linkage Committee) and Mr. Ahmadu Hussein (Student Competition Sub-committee).

Worthy of singular mention and appreciation is a member of the LOC - Mr Rasheed Abdulkadir Shehu who was a wonderful and reliable partner in progress. His calm and confident deportment to all knotty issues coming from any of the sub-committees translated in several ways to the accomplishment of this conference

The list of contributors to the success of this conference is almost endless. We are grateful to all Heads of Department and academic staff in the Faculty of Environmental Sciences who assisted in one way or the other to make the conference a resounding success. We hold all our paper reviewers, plenary chairpersons and rapporteurs in high esteem and thank them for their selfless services. Finally, I thank all the non-teaching staff and students of the Faculty for their roles. May God reward you all for your contributions.

Dr. Maimuna O. Abdulraheem
Chairperson, Local Organizing Committee

CONFERENCE CENTRAL ORGANISING COMMITTEE

Dr. Maimuna O. Abdulraheem - Department of Urban & Regina Planning – Conference Chair
Dr. N. A. Bello - Department of Estate Management - Conference Secretary
Dr. Ranti T. Adebisi - Department of Quantity Surveying - Member
Dr. A. I. Bako - Department of Urban & Regional Planning – Member
Mr. S.Y. Suleiman - Department of Architecture - Member
Mr. A.S. Rasheed - Department of Quantity Surveying - Member

SUB-COMMITTEES

Technical Committee

Dr. N. A. Bello - Chairman
Mr. A.S. Rasheed
Mr. H.Y. Agava
Mr. H.A. Ahmadu - Secretary

Logistics Committee

Dr. Maimuna O. Abdulraheem-Chairperson
Dr. Ranti T. Adebisi
Dr. A.B. Ola
Mr. A.K. Alade
Mrs. J.K. Adelabu
Mr. A.S. Rasheed - Secretary

Publicity & Linkage Committee

Dr. A. I. Bako - Chairman
Dr. Ayo Babalola
Mr. U.T.O. Moyo
Mr. S.Y. Suleiman
Mr. Rasheed Alao - Secretary

Student Paper Contest Committee

Mr. H.A. Ahmadu - Chairman
Mr. A.S. Rasheed
Mr. Idris Soliu
Mr. O.T.B Aduloju
Mr. H.A.Tanimu - Secretary

Conference Advisory Committee

Prof. L.T. Ajibade - Dean of Student Affairs, Department of Geography & Environmental Studies - University of Ilorin, Ilorin - Nigeria
Prof. N.B. Tanimowo - Department of Urban & Regional Planning, LAOTECH, Ogbomosho - Nigeria
Prof. A.D. Ibrahim - Department of Quantity Surveying, Ahmadu Bello University, Zaria - Nigeria
Prof. A.A. Adedeji - Department of Civil Engineering, University of Ilorin, Ilorin - Nigeria
Dr. R.G. Jimoh - Ag. Dean of Faculty of Communication & Information Studies, University of Ilorin, Ilorin - Nigeria

Paper Review Panel

Prof. A.A. Adedeji – Department of Civil Engineering, University of Ilorin.

Prof. L.T. Ajibade – Department of Geography, University of Ilorin

Prof. V. A. Bello - Department of Estate Management, Federal University of Technology, Akure- Nigeria

Prof. N.B. Tanimowo – Department of Urban and Regional Planning, LAUTECH

Prof. A.D. Ibrahim- Department of Quantity Surveying, Ahmadu Bello University, Zaria

Dr. Ganiyu Amuda-Yusuf - Department of Quantity Surveying, University of Ilorin, Ilorin -Nigeria

Dr. I. O. Orire - Department of Geography, University of Ilorin, Ilorin - Nigeria

Dr. N. A. Bello - Department of Estate Management, University of Ilorin, Ilorin - Nigeria

Dr. Bolaji Sulaiman - Department of Quantity Surveying, University of Ilorin, Ilorin - Nigeria

Dr. A. I. Bako - Department of Urban & Regional Planning, University of Ilorin, Ilorin - Nigeria

Dr. A. B Ola - Department of Urban & Regional Planning, University of Ilorin, Ilorin - Nigeria

Dr. K. B. Bolayemi - Department of Estate Management, Federal Polytechnic, Ilaro - Nigeria

Dr. Ranti. T. Adebisi - Department of Quantity Surveying, University of Ilorin, Ilorin - Nigeria

Dr. O. O. Olanrele - Department of Estate Management, University of Malaya, Malaysia - Nigeria

Dr. I. E. Wallace - School of Architecture, Victoria University of Wellington, New Zealand

Dr. Ayo Babalola - Department of Surveying & Geo-Informatics, University of Ilorin, Ilorin - Nigeria

Peer Review Process

The papers submitted to this conference were subjected to a rigorous peer review process which involved an initial review of abstract. A total of 150 abstracts were reviewed and 72 accepted. Afterwards, the authors of accepted abstracts were provided with the reviewers' comments and were advised to proceed to full paper submission, incorporating all suggested amendments in the reviewed abstracts.

Blind reviews of full manuscripts by minimum of two reviewers were carried out on the submitted manuscripts. A total of 72 full papers were received and the reviewer's comments were then sent to the authors of accepted papers with the request that they should address all of the issues raised by the reviewers. Tracked changes made by reviewers on authors' original papers were also sent to authors to help with revising their papers. A compliance check of authors returned corrected papers was further done to ensure that all the reviewer's comments were followed.

During the review process, members of the paper review panel, editors and conference organisers were not involved with the review of any paper they authored or co-authored.

A total of 52 papers of all authors who have demonstrated sufficient evidence that all reviewers' comments had been addressed were accepted into the conference proceedings.

Disclaimer

Considerable effort was put into ensuring the accuracy of this publication. In spite of this, the publishers and editors make no representation (expressed or implied) regarding the accuracy of the information provided therein and cannot accept any liability or legal responsibility for any omissions that may be made. The editors or publishers do not endorse or guarantee the claims made by the authors in the publication and the views expressed are not necessarily theirs but rather that of the authors. It is advised that every attempt should be made by the reader to verify the information contained therein.

Copyright© 2019

International Conference of Environmental Sciences (ICES 2019)

The copyright for papers published in the ICES 2019 Conference proceedings belong to authors of the papers. No unauthorized reproduction or distribution, in whole or in part of work published in the ICES Conference Proceedings by persons other than the authors is allowed without the written permission of authors or organisers of the ICES Conference.

ICES accept no liability for copyright infringements or inappropriate use of materials in any paper published. All authors developed their papers in line with the guiding principles of academic freedom and are responsible for good academic practice when conducting and reporting scientific research.

All enquiries relating to copyrights and request for permissions should be channeled to uifconference@unilorin.edu.ng

CONTENTS

Foreword	iv
Acknowledgements	vi
Conference Organising Committee and Sub-Committees	vi
Conference Paper Review Panel	vii
Peer Review Process	vii
Disclaimer	vii
Copyright Statement	vii
Contents	viii
Conference Programme	xii
Keynote Speaker 1	xix
Keynote Speaker 2	xxxii

SECTION 1: ARCHTECTURE AND HOUSING DEVELOPMENT MANAGEMENT

1	Assessment of Crowd Control Strategies in the Design of National Stadia at Abuja and Uyo, Nigeria <i>Naimu M. S and Abdulrahman M. E</i> -----	65
2	Retrofitting Prospects for Daylight Enhancement in ‘Dark’ Corridors of an Institutional Prototype Building <i>O. M. Idowu, A. A. Umar, S. Humphrey and A. U. Attah</i> -----	74
3	Assessment of Landscape Design Elements Application for Crowd Movement Optimization in Catholic Churches in Benue State, Nigeria <i>David Lubem Angitso and Chukwudum J. Eze</i> -----	86
4	The Challenges of Placemaking of Leisure and Recreation Parks Development in Nigeria <i>Abdulwahab Engworo Etudaiye, Abdullahi Sadauki, Yusuf Saliu and Ibrahim Yusuf Baba</i> -----	95
5	Critical Assessment of Fire Safety Measures in Shopping Malls, Abuja, Nigeria <i>Audu Francis Eleojo and M.E Abdulrahman</i> -----	107
6	Hardened Property of Blended Cement Mortar for Sustainable Housing Construction <i>Oyejobi, D. O., Adelabu, J. K., and Abdullahi, K. O.</i> -----	116
7	Assessment of Aspect Ratio and Configuration Effects in Corporate Office Buildings Courtyard, in Abuja, Nigeria <i>Ofiedane J.M and Eze J. C</i> -----	125
8	Architectural Design Considerations to Enhance Security in Mixed-Use Building, Lagos, Nigeria <i>Ogunbayo, R. A and Akande, O. K</i> -----	133

SECTION 2: CONSTRUCTION ECONOMICS AND COST MANAGEMENT

9	Influence of Risk Factors on Redevelopment Projects: A Case Study of Yankari Resort and Safari Project, Bauchi State <i>Aminu Muhammad Bashir</i> -----	143
---	--	-----

12]	Risk Management Strategy in Public Private Partnership on Housing Development - A Case of Niger State <i>Yatsu U.M and Kasimu M.A</i> -----	152
13]	Risk Factors Affecting Cost and Time Performance of Civil Engineering Projects in Kwara State <i>Idris Soliu, Awodele., O. A and Amuda-Yusuf., G</i> -----	163
14]	Appraisal of the Causes of Ineffectiveness of Skilled Tradesmen in Building Construction Industry in Lagos State----- <i>Olanrewaju, Rauf A., Adebisi, Ranti T. and Fasasi, Abdulwaheed</i>	175
15]	Drivers and Barriers to the Implementation of Green Building Development <i>Onososen, Adetayo Olugbenga and Osanyin Oladipupo</i> -----	182
16]	Appraisal of Causes and Effects of Delayed Payment on Building Construction Projects Delivery in Niger State <i>M. N. AminaI; J. E. Idiake and A. M. Kasimu</i> -----	192
17]	Evaluating Methods of Training of Mason for Productivity Improvement in Nigeria Construction Industry <i>Suleiman, Ayinde Elelu and John, Ebohimen Idiake</i> -----	202

SECTION 3: REAL ESTATE DEVELOPMENT AND PROPERTY MANAGEMENT

19]	The Impact of Emotional Intelligence on the Performance of Consultant Estate Surveyors and Valuers in Nigeria <i>Akinwamide, David Oluwatofunmi</i> -----	214
20]	Emerging Barriers to Efficient Urban Land Acquisition Process for Real Estate and Facilities Development in Nigeria <i>Kazeem .B. Akinbola,; Taofik .I. Salau,; and Nurudeen .A. Bello.</i> -----	225
21]	Challenges of Accessing Affordable Housing by Low-Income Civil Servants in Abuja, Nigeria <i>Olayinka Ezekiel Ajayi and Oyekunle Luqman Oyewobi</i>	
22]	Collaborative Working Relationship among Nigerian Built Environment Professionals: Factors and Benefits <i>Nurudeen Akinsola Bello, Kazeem Bolayemi Akinbola, Rasheed Olamide Alao, Sulaiman Adetoye Adepoju and Sulaiman Adesoji Olabisi</i> -----	245
23]	Conventional Approaches and Mechanism to Housing Market Analysis <i>Mohammed, J. K. and Sulyman, A. O.</i> -----	255
24]	Challenges and Opportunities of Resolving Land Use Conflicts through Mediation in Nigeria <i>Uwaezuoke, Ngozi Ifeanyi and Owolabi, Kayode Michael</i> -----	264
25]	User Satisfaction of Social Housing in Kaduna Metropolis <i>Julius Andrew Baji, Jonah Binga, Deborah Babarinsa, Mercy Richard Auta, Yakubu Ahmed Ubangari, and David Ayock Ishaya.</i> -----	272
26]	Effect of Public Budgeting on Neighbourhood Quality and Rental Values in Ilorin <i>W.A Durosinmi, M.T.A Ajayi, M.B Wahab, W.O Shittu and A.O Hassan</i> -----	280

SECTION 4: REMOTE SENSING AND DIGITAL INFORMATION SYSTEMS

29]	Assessment of Users' Satisfaction on Manual and Digital Land Information System in Kwara State, Nigeria <i>Adekoya, A. A., and Bello. M. O.</i> -----	293
-----	--	-----

30	Spatio-Temporal Analysis of Bida Housing Market Using Geographic Information System <i>Mohammed, J. K. and Sulyman, A. O.</i> -----	306
31	Establishment of Deformation and Subsidence Monitoring Baseline in the Coastal Environment: A Case Study of University of Lagos <i>Alademomi Alfred Sunday, Mayaki Anthony Omeiza, Daramola Olagoke Emmanuel and Salami Tosin Julius</i> -----	317
32	Design and Implementation of Sustainable Built Environment: The Role of Surveying and Geoinformatics towards Effective Collaboration with Other Professionals <i>Ahmadu, H. A., Babalola, A. and Salami, B. I.</i> -----	325
33	GIS as a Tool for Sustainable Development in Public Secondary School Mapping <i>Ipadeola A. O., Abdulyekeen A.O., and Olatunde G.</i> -----	332
34	A Review of Intelligent Transportation System: Adaptive Management <i>Busayo Adebisi, Risikat Folashade Adebisi, Ahmed Tijani Salawudeen and Abubakar Umar</i> -----	345

SECTION 5: URBAN / ENVIRONMENTAL MANAGEMENT AND PLANNING

36	Multidimensional Approach to Flood Vulnerability Assessment in Coastal Communities of Suleja and Tafa LGA, Niger State <i>Abdulhakeem Salau Bello and Muhammad Ahmed Emigilati</i> -----	358
37	An Assessment of Streetscape Infrastructure in Ilorin Metropolis, Nigeria <i>Abdulraheem M. O., Suleiman A. R. Alao R. O. Alimi R. K. Alade A. K and Garba I.O.</i> -----	369
39	The Practice and Challenges of Biomedical Waste Management: A Study of Selected Medical Facilities in Ile-Ife, Osun State <i>Ola, A. B.; Bako, A. I.; Abdulraheem, M. O.; Raheem, W. M.; Raheem, W. A. and Adewale, Y. Y.</i> -----	382
40	Understanding Vulnerability and Resilience of Ilorin Central Area, Ilorin, Kwara State <i>A.I. Bako, O. T. B. Aduloju, A. R. Suleiman, and F. O. Lawal</i> -----	398
41	Effect of Informal Activities on Urban Road Network Infrastructure in Minna, Niger State <i>Adeogun, A. S., Idowu, O. O., Olabisi S.A, and Iroh E.</i> -----	414
42	Gully Erosion: Vulnerability and Impact on the Resident of Agulu-Nanka <i>Nwokocha Oluchi and Musa Dalil</i> -----	429
43	Assessment of Spatial Changes in Coastal Ecosystem at Amuwo-Odofin, Lagos Nigeria <i>Alfred Sunday Alademomi, Tosin Julius Salami, Olagoke Emmanuel Daramola, Elias Adediran, and Joseph Olayemi Odumosu</i> -----	441
44	Evaluation of The Contribution Of Real Estate-Based Revenue To Igr Of Kwara State <i>Agava, Halim Yusuf, Adedotun, Ife Adeshola and Gombwer, Nenrot Wuyokwe</i> -----	453
45	Child Poverty Mapping: Towards Effective Child Poverty Reduction <i>Akande Sheerifdeen Olaide, Mohammed Ndana and Aremu Reuben</i> -----	471
46	Appraisal of urban regeneration in Isale Gangan Community in Lagos Island, Lagos State Nigeria. <i>Iyanda Oladimeji</i> -----	483

SECTION 6: INFORMATION TECHNOLOGY ADOPTION IN CONSTRUCTION

46	Bim Adoption Challenges in Malaysia: Expert Opinion. <i>Badiru, Y. Y.; R.B Tukur.; and Abdulazeez, A.D</i> -----	504
47	Sustainable Architectural Practices in Nigeria: Benefits of Adopting Building Information Modeling <i>Elimisiemon, Monday Chris</i> -----	513
48	Factors Affecting Human Resource Management in Small Construction Firms in Lagos Metropolis, Nigeria <i>Oluwaseyi Modupe Ajayi; Oluwasegun Emmanuel Akinsiku and Tajudeen Olufemi Salami</i> -----	523
49	Influence of Web-based Project Management System on Project Delivery <i>A.S. Rasheed and R. T Adebiyi</i> -----	532
50	Assessment of Readiness of Nigerian Construction Firms on Adoption of Lean Construction Principles <i>M.L Aisha and A.M. kasimu</i> -----	544
51	Perceptions of Career Development among Women in Nigeria Construction Industry <i>Adebiyi Ranti Taibat, Amuda-Yusuf Ganiyu, Rasheed Abdulkadir Shehu, Idris Soliu and Ola-Ade Esther Oluwafolakemi</i> -----	556
52	Effect of implementation of E-Procurement on Corrupt Practices in Nigerian Construction Industry <i>Odulana, A. O. and Oyewobi, L. O.</i> -----	566
53	Index of Authors -----	583
56	Index of Keywords -----	585

CONFERENCE PROGRAMME

DAY 1

MONDAY 29TH APRIL, 2019

PROGRAMME FOR THE OPENING SESSION

8:00 am - 9:30 am	Registration <i>Venue: University Main Auditorium</i>
9:30 am - 9:40 am	National Anthem & Unilorin Anthem / Introduction of Guest
9:40 am - 9:50 am	Opening Remarks by the Conference Chair. <i>Dr. Maimuna O. Abdulraheem, Chairperson, Organizing Committee</i>
9:50 am - 10:00 am	Welcome Address by the Host. <i>Dr. Ganiyu Amuda - Yusuf -Ag. Dean Faculty of Environmental Sciences</i>
10:00 am - 10:20 am	Vice Chancellors Address. <i>Prof. Sulyman Age Abdulkareem - Vice Chancellor University of Ilorin</i>
10:20 am - 11:00 am	Keynote Address 1. <i>Prof. Adeniyi Gbadegesin - Professor of Geography, Immediate Past Vice- Chancellor, LAUTECH, Ogbomosho.</i>
11:00 am - 11:40 am	Keynote Address 2 <i>Prof. Ahmad Doko Ibrahim - Professor of Quantity Surveying, Ahmadu Bello University, Zaria.</i>
11:40 am - 12:00 pm	Questions/Contributions/Responses
12:00 pm - 12:10 pm	Address by the Special Guest of Honour <i>Arc. M. J Faworaja. (MICIARB, MFIMS, FNIA, PPNIA) MD/CEO ARCHCON NIG. LTD</i>
12:10 pm - 12:30 pm	Launching of the Maiden Edition of Faculty of Environmental Sciences Journal - (Journal of Environmental Spectrum)
12:30 pm - 12:40 pm	Goodwill Messages
12:40 pm - 12:50 pm	Closing Remarks <i>Prof. N. B Tanimoowo - Pioneer Dean, Faculty of Environmental Sciences</i>
12:50 pm - 1:00 pm	Vote of Thanks <i>Dr. N.A Bello - Conference Secretary</i>

DAY 1

MONDAY 29TH APRIL, 2019

PROGRAMME FOR THE TECHNICAL SESSIONS

1:00 pm - 1:30 pm	Tea Break/Snacks/Small Chops
<u>PRE-CONFERENCE WORKSHOP</u> <i>Venue: University Main Auditorium</i>	
RESEARCH CLINIC	Chairperson: Prof. Titilayo A. Alabi
1:30 pm - 2:10 pm	Research Lecture:

*Prof. Ahmad Doko Ibrahim - Professor of Quantity Surveying,
Ahmadu Bello University Zaria.*

2:10 pm - 2:30 pm

Questions & Answers

2:30 pm - 3:00 pm

Lunch Break

FIRST PARALLEL SESSION

FIRST PARALLEL SESSION DAY 1 - MONDAY 29TH APRIL, 2019

VENUE: FACULTY OF COMMUNICATION AND INFORMATION SCIENCES [CIS]

GROUP 1

GROUP 2

**INFORMATION TECHNOLOGY
ADOPTION IN CONSTRUCTION**

**REMOTE SENSING & DIGITAL
INFORMATION SYSTEMS**

CHAIRPERSON: Dr. Saudat S. Baki

CHAIRMAN: Prof. J.F Olorunfemi

RAPPORTEUR: Dr. N. A Musa

RAPPORTEUR: Dr. Ayo Babalola

Paper 1:

Paper 1:

Bim Adoption Challenges in Malaysia:
Expert Opinion.

Assessment of Users' Satisfaction on Manual &
Digital Land Information System in Kwara State,
Nigeria

*Badiru, Y. Y.; R.B Tukur.; and Abdulazeez,
A.D*

Adekoya, A. A., and Bello. M. O.

Paper 2:

Paper 2:

Sustainable Architectural Practices in
Nigeria: Benefits of Adopting Building
Information Modeling

Spatio-Temporal Analysis of Bida Housing
Market Using Geographic Information System

Elimisiemon, Monday Chris

Mohammed, J. K. & Sulyman, A. O.

Paper 3:

Paper 3:

Factors Affecting Human Resource
Management in Small Construction Firms
in Lagos Metropolis, Nigeria

Establishment of Deformation & Subsidence
Monitoring Baseline in the Coastal Environment:
A Case Study of University of Lagos

*Oluwaseyi Modupe Ajayi; Oluwasegun
Emmanuel Akinsiku & Tajudeen Olufemi
Salami*

*Alademomi Alfred Sunday, Mayaki Anthony
Omeiza, Daramola Olagoke Emmanuel & Salami
Tosin Julius*

Paper 4:

Paper 4:

Influence of Web-based Project Management
System on Project Delivery

Design and Implementation of Sustainable Built
Environment: The Role of Surveying & Geo-
Informatics towards Effective Collaboration with
Other Professionals

A.S. Rasheed & R. T Adebiyi

3:00 pm - 5:00 pm

Paper 5:

Assessment of Readiness of Nigerian Construction Firms on Adoption of Lean Construction Principles

M.L Aisha & A.M. kasimu

Paper 6:

Perceptions of Career Development among Women in Nigeria Construction Industry

Adebiyi Ranti Taibat, Amuda-Yusuf Ganiyu, Rasheed Abdulkadir Shehu, Idris Soliu & Ola-Ade Esther Oluwafolakemi

Paper 7:

Effect of implementation of E-Procurement on Corrupt Practices in Nigerian Construction Industry

Odulana, A. O. & Oyewobi, L. O.

Paper 5:

GIS as a Tool for Sustainable Development in Public Secondary School Mapping

Ipadeola A. O., Abdulyekeen A.O., Olatunde G.

Paper 6:

A Review of Intelligent Transportation System: Adaptive Management

Busayo Adebiyi, Risikat Folashade Adebiyi, Ahmed Tijani Salawudeen & Abubakar Umar

5:00 pm -

CLOSING

5:10 pm

DAY 2 TUESDAY 30TH APRIL, 2019

SECOND PARALLEL SESSION

SECOND PARALLEL SESSION DAY 2 - TUESDAY 29TH APRIL, 2019

VENUE: FACULTY OF COMMUNICATION AND INFORMATION SCIENCES [CIS]

GROUP 1

GROUP 2

**ARCHITECTURE & HOUSING
DEVELOPMENT MANAGEMENT**

**CONSTRUCTION ECONOMICS & COST
MANAGEMENT**

CHAIRPERSON: Dr. Nasmat T. Surajudeen-Bakinde

CHAIRMAN: Prof. A.M Junaid

RAPPORTEUR: Dr. A.I. Bako

RAPPORTEUR: Dr. Ranti T. Adebiyi

Paper 1:

Paper 1:

8:30 am - 10:30 am

Assessment of Crowd Control Strategies in the Design of National Stadia at Abuja and Uyo, Nigeria

Naimu M. S & Abdulrahman M. E

Paper 2:

Retrofitting Prospects for Daylight Enhancement in ‘Dark’ Corridors of an Institutional Prototype Building

O. M. Idowu, A. A. Umar, S. Humphrey & A. U. Attah

Paper 3:

Assessment of Landscape Design Elements Application for Crowd Movement Optimization in Catholic Churches in Benue State, Nigeria

David Lubem Angitso & Chukwudum J. Eze

Paper 4:

The Challenges of Placemaking of Leisure & Recreation Parks Development in Nigeria

Abdulwahab Engworo Etudaiye, Abdullahi Sadauki, Yusuf Saliu & Ibrahim Yusuf Baba

Paper 5:

Critical Assessment of Fire Safety Measures in Shopping Malls, Abuja, Nigeria

Audu Francis Eleojo & M.E Abdulrahman

Paper 6:

Hardened Property of Blended Cement Mortar for Sustainable Housing Construction

Oyejobi, D. O., Adelabu, J. K., & Abdullahi, K. O.

Paper 7:

Influence of Risk Factors on Redevelopment Projects: A Case Study of Yankari Resort & Safari Project, Bauchi State

Aminu Muhammad Bashir

Paper 2:

Risk Management Strategy in Public Private Partnership on Housing Development. A Case of Niger State

Yatsu U.M and Kasimu M.A

Paper 3:

Risk Factors Affecting Cost and Time Performance of Civil Engineering Projects in Kwara State

Idris Soliu, Awodele., O. A & Amuda-Yusuf., G

Paper 4:

Appraisal of the Causes of Ineffectiveness of Skilled Tradesmen in Building Construction Industry in Lagos State

Olanrewaju, Rauf A., Adebisi, Ranti T. & Fasasi, Abdulwaheed

Paper 5:

Drivers and Barriers to the Implementation of Green Building Development

Onososen, Adetayo Olugbenga & Osanyin Oladipupo

Paper 6:

Appraisal of Causes and Effects of Delayed Payment on Building Construction Projects Delivery in Niger State

M. N. Amina; J. E. Idiake & A. M. Kasimu

Paper 7:

Assessment of Aspect Ratio & Configuration Effects in Corporate Office Buildings Courtyard, in Abuja, Nigeria

Ofiedane J.M & Eze J. C

Evaluating Methods of Training of Mason for Productivity Improvement in Nigeria Construction Industry

Suleiman, Ayinde Elelu & John, Ebohimen Idiake

Paper 8:

Architectural Design Considerations to Enhance Security in Mixed-Use Building, Lagos, Nigeria

Ogunbayo, R. A & Akande, O. K

10:30 am -

TEA BREAK

11:00 am

THIRD PARALLEL SESSION

THIRD PARALLEL SESSION DAY 2 - TUESDAY 30TH APRIL, 2019

VENUE: FACULTY OF COMMUNICATION AND INFORMATION SCIENCES [CIS]

GROUP 1

GROUP 2

URBAN/ENVIRONMENTAL MANAGEMENT & PLANNING

REAL ESTATE DEVELOPMENT AND PROPERTY MANAGEMENT

CHAIRMAN: Prof. A.M Junaid

CHAIRMAN: Prof. B.T Aluko

RAPPORTEUR: Dr. A.B Ola

RAPPORTEUR: Dr. Ranti T. Adebisi

Paper 1:

Paper 1:

Multidimensional Approach to Flood Vulnerability Assessment in Coastal Communities of Suleja and Tafa LGA, Niger State

The Impact of Emotional Intelligence on the Performance of Consultant Estate Surveyors and Valuers in Nigeria

Abdulhakeem Salau Bello and Muhammad Ahmed Emigilati

Akinwamide, David Oluwatofunmi

Paper 2:

Paper 2:

An Assessment of Streetscape Infrastructure in Ilorin Metropolis, Nigeria

Emerging Barriers to Efficient Urban Land Acquisition Process for Real Estate and Facilities Development in Nigeria

Abdulraheem M. O., Suleiman A. R. Alao R. O. Alimi R. K. Alade A. K & Garba I.O.

Kazeem .B. Akinbola; Taofik .I. Salau,; Nurudeen .A. Bello.

11:00 am - 1:00 pm

Paper 3:

Assessment of Spatial Changes in Coastal Ecosystem at Amuwo-Odofin, Lagos Nigeria

Alfred Sunday Alademomi, Tosin Julius Salami, Olagoke Emmanuel Daramola, Elias Adediran, & Joseph Olayemi Odumosu

Paper 4:

The Practice and Challenges of Biomedical Waste Management: A Study of Selected Medical Facilities in Ile-Ife, Osun State

Ola, A. B.; Bako, A. I.; Abdulraheem, M. O.; Raheem, W. M.; Raheem, W. A. & Adewale, Y. Y.

Paper 5:

Understanding Vulnerability and Resilience of Ilorin Central Area, Ilorin, Kwara State

A.I. Bako, O. T. B. Aduloju, A. R. Suleiman, & F. O. Lawal

Paper 6:

Effect of Informal Activities on Urban Road Network Infrastructure in Minna, Niger State

Adeogun, A. S., Idowu, O. O., Olabisi S.A, & Iroh E.

Paper 7:

Gully Erosion: Vulnerability and Impact on the Resident of Agulu-Nanka

Nwokocha Oluchi and Musa Dalil

Paper 8:**Paper 3:**

Challenges of Accessing Affordable Housing by Low-Income Civil Servants in Abuja, Nigeria

Olayinka Ezekiel Ajayi & Oyekunle Luqman Oyewobi

Paper 4:

Collaborative Working Relationship among Nigerian Built Environment Professionals: Factors and Benefits

Nurudeen Akinsola Bello, Kazeem Bolayemi Akinbola, Rasheed Olamide Alao, Sulaiman Adetoye Adepoju & Sulaiman Adesoji Olabisi

Paper 5:

Conventional Approaches and Mechanism to Housing Market Analysis

Mohammed, J. K. & Sulyman, A. O.

Paper 6:

Challenges and Opportunities of Resolving Land Use Conflicts through Mediation in Nigeria

Uwaezuoke, Ngozi Ifeanyi & Owolabi, Kayode Michael

Paper 7:

User Satisfaction of Social Housing in Kaduna Metropolis

Julius Andrew Baji, Jonah Binga, Deborah Babarinsa, Mercy Richard Auta, Yakubu Ahmed Ubangari, & David Ayock Ishaya

Paper 8:

Evaluation of Petrol Filling Stations
Against Established Standards in
Ilorin Metropolis.

*Tanimowo, N. B., Raheem, W. M.,
Owolabi, O. Q., Raheem, M. O.,
Salawu, G. O. and Onundi
Lawal, F. O.*

Effect of Public Budgeting on Neighbourhood
Quality and Rental Values in Ilorin

*W.A Durosinmi, M.T.A Ajayi, M.B Wahab, W.O
Shittu & A.O Hassan.*

Paper 9:

Child Poverty Mapping: Towards
Effective Child Poverty Reduction

*Akande Sheerifdeen Olaide,
Mohammed Ndana & Aremu Reuben*

Paper 9:

Evaluation of the Contribution of Real Estate-
based Revenue to IGR of Kwara State.

*Agava, Halim Yusuf; Adedotun, Ife Adeshola &
Gombwer, Nenrot Wuyokwe*

1:00 pm - 2:00 pm

STUDENT COMPETITION PRESENTATION

2:00 pm - 3:00 pm

LUNCH

3:00 pm - 4:00 pm

CONFERENCE COMMUNIQUE

CERTIFICATES & CLOSING

DEPARTURE

CHILD POVERTY MAPPING: TOWARDS EFFECTIVE CHILD POVERTY REDUCTION

¹Akande Sheerifdeen Olaide, ¹Mohammed Ndana and ²Aremu Reuben

¹Department of Urban and Regional Planning, Federal University of Technology, Minna - Nigeria

¹Department of Urban and Regional Planning, Kogi State Polytechnic, Lokoja

Abstract

Poverty is not a respecter of gender nor age; it is a problem that affects male and female, and people of various age group alike. However, women and children are more susceptible to poverty compared adult. Poverty manifest in children in many forms; through lack of access to sanitation, education, health, water, food, and shelter among others. This study, therefore, seeks to analyse child poverty in Minna, using a multi-dimensional approach; with a view suggest possible ways of ameliorating child poverty menace in the study area. The study adopts the exploratory and descriptive research design which involves survey and observation. The study population is 54, 141 households within the 24 neighbourhoods of Minna, while the sample size is 386 households. The study area was delineated based on neighbourhood boundary, while households were randomly selected for sampling within each of the 24 neighbourhoods. A total of 321 questionnaires were returned completed, while the data was analysed using descriptive statistics and multi-dimensional poverty measurement approach developed by Alkire and Forster (2007). The study established that multidimensional child poverty headcount in Minna is 50.9%, while 28.7% only experience child poverty from a uni-dimension. The intensity of child poverty in Minna is moderate (0.52), while Minna does not experience child poverty (0.29). However, neighbourhoods level result shows that thirteen neighbourhoods experience medial child poverty while two neighbourhoods experience acute child poverty. The study concludes that child poverty dynamics varies across spatial units as can be seen at neighbourhood level. Hence, attention must be paid to the spatial disparities that exist within the city if child poverty must be drastically reduced. Therefore, the study concludes that a concerted effort must be put in place to enhance the adequate provision of necessities for sustainable development.

Keywords: *Access, Child Poverty, Indicators, Multi-dimensional Poverty Index, Sustainable development*³⁹

1.0 INTRODUCTION

Evolving a universal definition of poverty is a difficult task; the question of how best to define poverty has been at the centre stage of economic development debate since world war II. The traditional concept of poverty has been described based on resource deprivation and analysed using monetary indicators. In recent time, the concept of poverty has shifted towards a broad definition of multidimensional deprivation where poverty is seen from the broader lens of non-economic deprivations (Sumner 2004; Baschieri & Falkingham 2007). The shift from the traditional concept of poverty to the multidimensional approach translates to the emergence of

Corresponding Mail: aaolaide@gmail.com

Akande S. O., Mohammed N. and Aremu, R., (2019). CHILD POVERTY MAPPING: TOWARDS EFFECTIVE CHILD POVERTY REDUCTION. Collaboration for Sustainable Development in the Built Environment. International Conference of Environmental Sciences, ICES 2019. 1st International Conference of the Faculty of Environmental Sciences, University of Ilorin, Nigeria, 29th - 30th April 2019.

new empirical measurement approach as well as policies and programmes. A typical example is the multidimensional poverty measure by Forster and Alkire (2007), while the Sustainable Development Goals (SDGs) by the United Nations General Assembly and Nigeria's National Poverty Eradication Programme (NAPEP) are among the poverty reduction policies and programmes developed at International and local level.

Despite the unprecedented progress achieved in poverty reduction within the last three decades, children account for a significant proportion of the world's poorest people (United Nations Children's Fund (UNICEF) and Global Coalition to End Child Poverty (GCECP), 2017). Children make up one-third of the population of developing countries, of which 50% (385 million) are income poor (UNICEF/GCECP, 2017). This is an indication that children are the most affected by poverty in developing countries of which Nigeria is not an exception. According to UNICEF (2015) one out of every eight children in the OECD countries is growing in poverty accounting for about 30 million children. One of every three children in the developing world lacks access to basic sanitation, and one of every five has no access to safe drinking water (UNICEF, 2009).

Although child poverty is more prevalent in low-income countries, it is a global challenge that affects both developed and developing countries. UNICEF (2013) stated that 54% of Nigerians live on less than 1 dollar per day, going by this statistics, it is evident that significant proportion of children from poor households may experience child poverty due to their reliance on parents for essential goods and needs (Ashworth *et al.*, 2003). Child poverty in Nigeria manifests in many ways such as poor access to education, quality water, healthcare facility, food and security. Child poverty is not a problem that is peculiar to the rural areas; the urban areas also enjoy a fair share of the problem (Umukoro, 2013). Child poverty in urban areas can be seen through the lens of street hawking, Almajiri system, and child abuse, among others. While in rural areas, child poverty manifests in the form of the absence of basic goods and services such as water, healthcare and low school enrolment, to name a few.

1.1 The Statement of Research Problem

In the last three decades, quite some studies have been conducted on child poverty using different methodologies and measurement approach (Forster *et al.*, 1984; Summer, 2004; Adetola and Olufemi, 2012; Rufai, *et al.*, 2016). The earlier studies conducted by (Forster *et al.*, 1984; Summer, 2004) measured child poverty through the narrow lens of income. Despite the importance of income in child poverty assessment; it has been criticised on numerous grounds. The monetary approach to child poverty does not account for the social, physical and emotional effect of poverty on the children. For example, the nutrition of a child can affect both the education and health of the child, which can, in turn, affect the long-term development of the child.

The criticism of the monetary approach led to the development of the multidimensional poverty methodology. More recently, the multidimensional approach has been adopted among other methods by scholars and international organisations in poverty assessment. The multidimensional poverty index (MPI) is the most widely adopted approach to

multidimensional poverty assessment; this method accounts for the breadth, depth and severity of poverty. In Nigeria, only a few studies have adopted the use of MPI to child poverty estimation (Adetola and Olufemi, 2012; Rufai, et al., 2016). However, these studies do not account for the spatial disparities in child poverty; thereby providing aggregated information on child poverty. Accounting for the spatial disparities in child poverty regarding the breadth, depth and severity of child poverty is essential for effective child poverty policy and programmes development and implementation. Therefore, there is a need for child poverty data disaggregation to account for the spatial disparity for effective child poverty reduction through the use of Geographic Information System (GIS) tools.

Investing in children and reducing child poverty is a prerequisite for sustainable economic and social development (Sanfilippo *et al.* 2012). Hence, the importance of child poverty reduction can never be overemphasised. Reducing poverty and insecurity which are the hallmark of the challenges bedevilling many parts of the country requires proper child poverty estimation that will lead to the development of child poverty reduction policies and programmes. Eradicating child poverty is not only about child poverty measurement; it is also about identifying the location of the poor child. This study provides information on the dimensions of poverty experienced by children in Minna, which will aid the implementation of child poverty reduction in this direction. The breadth, depth and severity of child poverty were also accounted across the spatial unit of Minna. The spatial disparity in child poverty among the neighbourhoods by dimension, breadth, depth, and severity was also accounted for to understand the peculiarity of child poverty across the spatial units. The findings of this study provide the necessary tool for the development of policies and programmes as well as the implementation of child poverty reduction strategies in Minna.

2.0 LITERATURE REVIEW

Ngeutse, Tegoum and Hevi (2009) conducted a study on the extent of household and child poverty using multi-criterion analysis (MCA) in Cameroun. Five (5) non-monetary indicators derived from the third multiple surveys were used which included nutrition, access to potable water, health, education and lodging while multidimensional household poverty was accessed using accessibility to water, hygiene, patrimony, lodging and level of education of household head. The hierarchical classification models constructed from the MCA was used to identify non-poor and poor households. The study established that child poverty is occasioned by child health as against the household which is dependent on the comfort of the household to which the child belongs. The trend analysis of multidimensional child poverty was carried out by Plavgo *et al.* (2013) using DHS data of 2000, 2005, and 2011 in Ethiopia. The MODA method was adopted to define the thresholds, while the extent of deprivation among children was determined using nutrition, health, water, sanitation, housing and information. THE MPI developed by Alkire and Foster (2007) was employed as an analytical tool for child poverty estimation. Comparative analysis of child deprivation headcount ratio and household poverty index revealed that household poverty level is not a determinant of child poverty in the rural areas.

Landiyanto (2013) employed the use of multiple cluster survey (MICS) data for assessing the multidimensional poverty in Papua. Similarly, MPI was used as an analytical tool, while the indicators of child poverty were defined using the Bristol approach. The study established that the children suffer almost all dimensions of deprivation. However, some children fall within the middle, fourth and richest quintile that were not recognised as poor based on the asset index that was deprived in some of the child poverty indicators. Adetola and Olufemi (2014) assessed the determinant of child poverty in rural Nigeria using the multidimensional approach. The data used were sourced from the Demographic and Health Survey, 2008 data. Children under five years were the focus of the study. In all, a total of 4,543 children were sampled. A single step Multiple Correspondence Analysis (MCA) was carried out to generate weights for five dimensions of safe drinking water, sanitation, housing, health and nutrition adopted in the study. Like the previous studies, MPI was used to determine multidimensional poverty profiles of the children. When the poverty cut off $K=1$, 52% of the children were multidimensional poor as against 27.9% poor when $k=3$. These imply that when children are deprived in at least one dimension, 52% are multidimensional poor. The health and sanitation dimensions had the highest relative contribution of 38.54% and 22.58% respectively to the overall multidimensional poverty index.

Furthermore, Rufai, *et al.* (2016) also assessed child poverty in rural Nigeria. This study investigates the extent of poverty among under-five children in rural Nigeria and its distribution across household wealth status. The study used the 2013 DHS data. The Alkire and Foster counting approach was used to generate poverty profiles among the children while descriptive statistics were used to assess their distribution. The results revealed a significant level of poverty among the children and poor children were found in all classes of household poverty. The study recommended that specific policies targeting deprivations suffered by children should be used to address child poverty.

2.3 Summary

The existing studies on child poverty show that multidimensional child poverty is gradually gaining more attention within Nigeria and the world at large. However, majority of these studies relies on secondary data collected Demographic Household Survey data which are usually streamlined to the mission of the survey. Extant review of literature also shows that a significant proportion of the studies focus on children between the age of 0-5, which is against the United Nations definition of 0-18 years. This implies that a large proportion of the children are mostly not accounted for in the child poverty assessment. The study also shows that information on child poverty is mostly aggregated and conducted in rural areas, therefore making it difficult to identify the location of the poor child. Disaggregating child poverty data to a smaller spatial unit of neighbourhood or district will enhance the quality of the data and as well aid effective implementation of child poverty eradication measures/strategies. Therefore, this study attempt to map child poverty dynamics regarding dimension, breadth, depth and severity in Minna, Niger State.

3.0 METHODOLOGY

A) The scope of the study

The study was conducted within the geographic boundary of Minna. Minna according to Owoyele (2014) has a total of 24 neighbourhoods which forms the basis of analysis for the study. Five indicators were used to determine multidimensional child poverty in Minna which include education, water, housing, communication, and sanitation as adapted from Alkire and Forster (2007). The study focused on establishing the dimensions of child poverty, breadth, depth, and severity of child poverty experienced in Minna.

B) Type and Source of Data

The data used were sourced primarily from the field using the open data toolkit (ODK). The data collected include household information on education of children (years spent in school, number of school-age children out of school), water access (availability, location, distance, and time spent), housing quality, household sanitation (availability of toilet, location of toilet, shared toilet facility), as well as availability of communication and information gadget e.g. television, radio, phone, internet service.

C) Sampling Procedure

The unit of measurement for the study is the household. Therefore, the projected number of households in Minna was derived from the National Census of 2006 at 3.6% growth rate and a base population of 201429. The project projected population of Minna in 2018 is estimated at 324846, while the average number of households is 54141 using the national average household size of 6 persons per household. The sample size is 321 using Sallant and Dillman sample size formula at 95% confidence level and confidence interval of 5. Multistage sampling technique was adopted; the study area was divided into twenty-four cluster using neighbourhoods, while households were randomly selected from each cluster for questionnaire administration. The number of questionnaires administered within each cluster is determined by the ratio of the cluster population to the total population of the study area.

D) Analytical Technique

The data collected were analysed using descriptive statistic, Multidimensional approach by Alkire and Foster (2007) and Mapping using symbology for gradient mapping in ArcGIS 10.3

I) Descriptive Statistics

The descriptive statistics was used to provide a general background for the study using frequency, percentage, mean, minimum and maximum.

II) Multidimensional Poverty Index

The multidimensional poverty index was developed by Alkire and Forster (2007) to measure poverty from multidimensions. The method has been widely adopted because of the advantage it posses over other multidimensional poverty measures by accounting for the depth and severity of poverty. The formula for determining the poverty headcount is

$$H = \frac{q}{n} \dots \dots \dots \text{equation (1)}$$

Where H is the poverty headcount; q is the number of persons deprived and n is the total number of people in the cluster. The poverty headcount is otherwise known as the breadth of poverty.

The intensity of poverty which is otherwise known as the depth of poverty is expressed mathematically as: $A = \frac{\sum k}{N}$equation (2)

Where A is the intensity/depth of poverty; $\sum k$ is the sum of deprived persons, while N is the total population. The multidimensional poverty is expressed mathematically as the product of poverty headcount and the intensity of poverty:

$M = H \times A$Equation (3)

The dimensions and cutoffs is presented in Table 1.

The three broad dimensions of the assessment was weighted equally. Hence education, health, and living standard is weighted 1/3 respectively. The sub-dimensions were weighted based on a number of subdimensions of the broad dimension. Health has two subdimensions and each subdimension carries a weight of 1/6, education has no subdimension and therefore maintains the weight of 1/3, while living standard has 4 subdimensions weighted 1/12 respectively.

Table 1: Child Poverty Indicator and Dimensions

Dimensions		Indicators – a child is deprived,	Weight
Health	Immunisation	If the child hasn't been immunised before the age of 2 or does not have access to a health facility.	<u>1/6</u>
	Sanitation	If a child uses unimproved sanitation facilities (pit latrine without slab, open pit latrine, bucket latrine and hanging toilet) or shares toilet with other families.	1/6
Living standard	Housing	If a child lives in a household with inadequate flooring (dung, Sand or dirt floor) or inadequate roofing or overcrowded in a room (more than 4 or more persons in a room).	1/12
	Safe Drinking Water	If it takes up to 30minutes for a child to get water or use unsafe water sources (surface water, open wells).	1/12
	Information / Communication	If a child does have no access to radio or television, Phone.	1/12
	Cooking Fuel	If a household cooks with tradition fuel (firewood, sawdust, charcoal or animal dung)	1/12
Education	School attendance	Within the age of 6-17 years not attending school or hasn't completed primary education.	1/3

Table 1: Dimension and Indicators

Source: Adapted from the UNICEF Global Study on Child Poverty among developing countries (2011).

4.0 RESULT AND DISCUSSION

4.1 Child Poverty Headcount

The poverty headcount in Minna by neighbourhoods is presented in Table 2. The result shows the poverty headcount of children who are deprived of a single dimension compared to those that suffer deprivation from multiple dimensions. The result shows that Bosso town (38.2%) had the highest proportion of children that suffer from a single dimension of deprivation. Limawa (37.2%), Sauka-Kahuta (36.3%), Sabon Gari (36.1%), and Makera (35.2%) were among the five neighbourhoods with the highest proportion of children suffering from a single dimension of deprivation. Table 2 also shows that the average deprivation from a single dimension in Minna is 28.7%, while GRA (3.9%), F-layout (12.7%), and Bosso estate (18.9%) had the lowest poverty headcount from a single dimension.

Poverty headcount from multiple dimension is also depicted in Table 2. The result shows that 50.9% of the children in Minna suffer from multiple deprivations. Multiple deprivations in Minna by neighbourhoods range from 8.9% in GRA to 72.4% in Kpakungu. Neighbourhoods with a high proportion of children that suffers multiple deprivations are: Barkin Saleh (69.3%), Tudun Fulani (64.3%), Maitumbi (63.4%), Tayi Village (61.8%), Jikpan (61.5%), Limawa (61.2%). In GRA (8.9%) and F-layout (25.1%) children that suffer multiple deprivations are less than one-third of the population. Furthermore, the child poverty headcount was classified into four classes of very low, low, moderate and high using Jenks classification method. The result of the classification for single deprivation and multiple deprivations is depicted in Figure 1 and Figure 2 respectively.

Table 2: Poverty Headcount by Dimension By Neighbourhoods in Minna

Neighbourhoods	K=1	K>2
Angwan Daji	32.2	59.7
Barkin Saleh	30.6	69.3
Bosso Estate	18.9	37.8
Bosso Town	38.2	47.5
Chanchaga	26.5	56.6
Dutsen Kura Gwari	21.3	49.5
Fadikpe	23	42.3
F-Layout	12.7	25.1
GRA	3.9	8.9
Jikpan	31.8	61.5
Kpakungu	24.5	72.4
Limawa	37.2	61.2
Maitumbi	31.4	63.4
Makeera	35.2	57.4
Minna Central	30.2	53.9

Nasarawa	33.6	54.1
Sabongari	36.1	57.8
<u>Sahuke</u> Kahuta	36.3	56.2
Shango	30.9	54.2
Tayi Village	27.5	61.8
Tudun Fulani	33.4	64.3
Tudunwada North	27.3	38.1
Tudunwada South	22.2	33.2
Tunga Low-cost	21.8	36.7
Minna	28.7	50.9

Figure 1 shows that Tudun Fulani, Bosso town, Barkin Saleh, Limawa, Makeera, Sabon Gari, and Nassarawa had a high proportion of children who suffer Uni-deprivation while only GRA and F-layout had a very low proportion of children that suffer from a Uni-deprivation. Nine neighbourhoods recorded a moderate proportion of children that suffer from a single deprivation; these neighbourhoods are: Maitumbi, Chanchaga, Shango, Tayi village, Jikpan, Minna central, Angwan daji, Kpakungu, and Tudunwada north, while other neighbourhoods had low poverty headcount of unidimensional deprivation. However, Figure 2 shows that four neighbourhoods had high multiple child poverty headcounts, these neighbourhoods are Tudun Fulani, Kpakungu, Barkin Saleh, and Maitumbi. GRA and F-layout had very low proportion of children who suffer from multiple child deprivation, while multiple child poverty headcounts in Fadikpe, Bosso town, Bosso estate, Tunga, Tudun wada north and south is low. The intensity of child poverty and the multidimensional child poverty index is presented in Table 3.

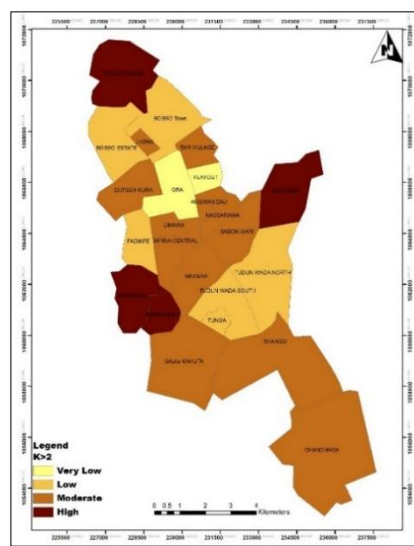
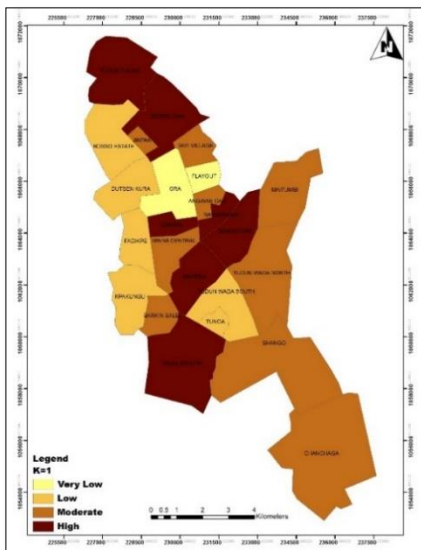


Figure 1: Uni-Dimensional Deprivation**Figure 2: Multiple Dimension of Deprivation**

The result shows that the intensity of child poverty in GRA (0.03), F-layout (0.15) and Bosso estate (0.20) is low, while the intensity of child poverty in Tunga (0.32), T/wada north (0.31), T/wada south (0.34), and Fadikpe (0.47) is moderate. The result also shows that a high intensity of child poverty is experienced in other neighbourhoods of Minna.

The multidimensional child poverty index is computed using the 30% (0.30) benchmark. The result shows that nine neighbourhoods do not experience child poverty (non-poor) with multidimensional poverty index (MPI) of less than 0.30. These neighbourhoods are Bosso estate (0.08), Bosso town (0.27), Dutsen Kura (0.28), Fadikpe (0.20), F-layout (0.04), GRA (0.00), T/wada north (0.12), T/wada south (0.11), and Tunga lowcost (0.12).

Table 3: Intensity and Multidimensional Poverty Index in Minna

Neighbourhoods	Intensity	Remark	MPI	Remark
Angwan Daji	0.53	High	0.32	Medial
Barkin Sale	0.76	High	0.53	Acute
Bosso Estate	0.20	Low	0.08	Non-Poor
Bosso Town	0.57	High	0.27	Non-Poor
Chanchaga	0.62	High	0.35	Medial
Dutsen Kura Gwari	0.56	High	0.28	Non-Poor
Fadikpe	0.47	Moderate	0.20	Non-Poor
F-Layout	0.15	Low	0.04	Non-Poor
GRA	0.03	Low	0.00	Non-Poor
Jikpan	0.68	High	0.42	Medial
Kpakungu	0.73	High	0.53	Acute
Limawa	0.63	High	0.39	Medial
Maitumbi	0.68	High	0.43	Medial
Makeera	0.65	High	0.37	Medial
Minna Central	0.57	High	0.31	Medial
Nasarawa	0.60	High	0.33	Medial
Sabongari	0.62	High	0.36	Medial
Sahuke Kahuta	0.57	High	0.32	Medial
Shango	0.60	High	0.32	Medial
Tayi Village	0.65	High	0.40	Medial
Tudun Fulani	0.68	High	0.44	Medial
T/wada North	0.31	Moderate	0.12	Non-Poor
T/wada South	0.34	Moderate	0.11	Non-Poor
Tunga Low-cost	0.32	Moderate	0.12	Non-Poor

Minna	0.52	High	0.29	Non-poor
-------	------	------	------	----------

Intensity: 0-0.29= Low; 0.31-0.49=Moderate; 0.50-0.79=High; and 0.80-1.0=Very high
MPI: 0-0.29= Non poor; 0.31-0.49=Medial; 0.50-0.79=Acute; and 0.80-1.0=Ultra

However, thirteen neighbourhoods experience medial child poverty with MPI value of 0.31-0.49, while Barkin Saleh and Kpakungu experience acute child poverty with MPI of 0.53 respectively. The child poverty intensity in Minna is 0.52 (moderate) while multidimensional child poverty index is 0.29 (Non-poor). This result is in contrast with the result of the individual neighbourhoods, which shows that thirteen neighbourhoods experience medial and two neighbourhoods (Barkin Saleh and Kpakungu) experience acute poverty. This is an indication that the aggregation of data hide useful information that can enhance effective policy development and implementation.

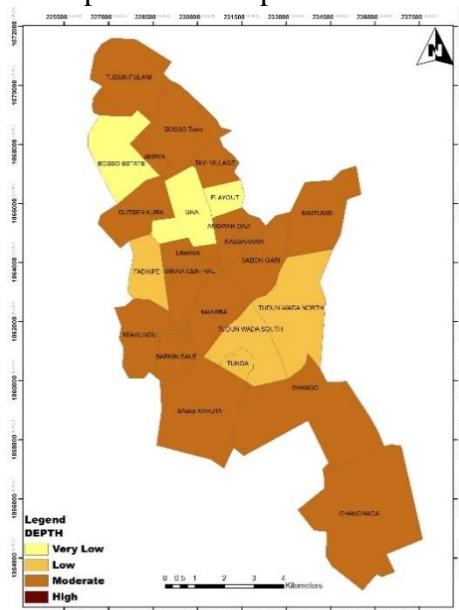


Figure 3: Child Poverty Intensity

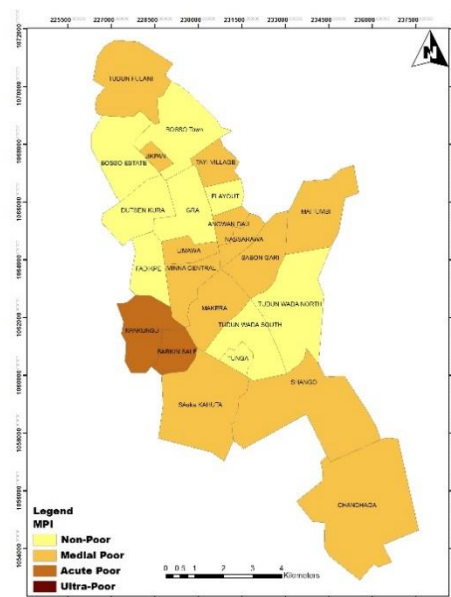


Figure 4: Multidimensional Child Poverty

The child poverty intensity and MPI is depicted in Figure 3 and 4 respectively. The result shows that child poverty is prevalent in fifteen neighbourhoods out of twenty-four, which calls for concern. Although none of the neighbourhood experience ultra-child poverty. However, child poverty manifests in most neighbourhoods and more pronounce in Barkin Saleh and Kpakungu.

Conclusion and Recommendations

This study measured child poverty in Minna by neighbourhood using Alkire and Forster (2007) approach to determine the level of multiple deprivations experience by children within Minna town with an emphasis on the spatial variations that exist within the spatial unit (neighbourhoods) of the town. The study shows that a significant majority of the children

experience deprivations from multiple dimensions compared to those who experience deprivation from a single dimension. This is an indication that the deprivations experienced by children is multidimensional and must be tackled from all angles. The multiple dimension of deprivation experienced by children is occasioned by poor access to water, sanitation, clean cooking fuel and poor housing condition. The intensity of child poverty in most of the neighbourhoods is high while only seven neighbourhoods had low or moderate intensity of child poverty. This shows that the depth of child poverty experienced by children within most of the neighbourhoods is deep, which means it will require concerted efforts from all stakeholders to tackle this problem. The spatial variation of the multidimensional child poverty in Minna is a pointer toward the aspects and areas that need proper planning and implementation of poverty reduction programmes, particularly those that are child-friendly. The study suggests approaching these problems through sustainable approaches and strategies, which are more of commitments than routine inclusion on print.

References

- Adetola, A., & Olufemi, P. (2012). Determinants of child poverty in rural Nigeria: A Multidimensional Approach. *Global Journal of Human-Social Science Research*, 12(12-A).
- Alkire, S. and J. Foster (2007). "Counting and Multidimensional Poverty Measurement." OPHI Working Paper No. 7. Oxford, University of Oxford.
- Ashworth, K., Hill, M. and Walker, R. (2003), 'Patterns of childhood poverty: new challenges for policy', *Journal of Policy Analysis and Management*, 13:658–680.
- Baschieri, A. & Falingham, J. (2007). *Child poverty in Tajikistan*. Report prepared for the UNICEF country office. Dushanbe: Tajikistan.
- Foster, James, J. Greer, and Erik Thorbecke, 1984, "A Class of Decomposable Poverty Measures", *Econometrica* 52:761-66.
- Landiyanto, E. A. (2013). *Multidimensional Child Poverty in Papua: Empirical Evidence from 6 Districts*. SMERU Research Institute.
- Plavgo I., Kibur M., Bitew M., Gabreselassie T., Matsuda Y. and Pearson R. (2013): Multidimensional child deprivation trend analysis in Ethiopia. Further analysis of the 2000, 2005 and 2011 demographic health surveys. DHS further analysis Reports No. 83 Calverto, Maryland, USA: ICF International.
- Sanfilippo, M., De Neubourg, C., & Martorano, B. (2012). The impact of social protection on children. *UNICEF Office of Research* https://www.unicef-irc.org/publications/pdf/iwp_2012_06.pdf.
- Sumner, A. (2004). Economic wellbeing and Non-economic wellbeing: A review of the meaning and measurement of poverty. *United Nations University World Institute for Development Economics Research Research Paper*. No. 2004/30.

- Rufai A.M., Yusuff S.A1., Awoyemi T.T.,Salman K.K., Oyekale A.S. (2016). Child Poverty in Rural Nigeria. *Journal of Poverty, Investment and Development*. 20(2014), 40-51
- Umukoro, N. (2013). Poverty and Social Protection in Nigeria. *Journal of Developing Societies*. 29 (3), p305-322.
- UNICEF (2015). *State of the World's Children 2015. Children with Disabilities*. UNICEF. New York. 2013.
- UNICEF (2009) *National Study on Child Poverty and Disparities in the Kyrgyz Republic*. UNICEF, Bishek <https://sites.google.com/site/kyrgyzstanchildpovertystudy>