

**ENERGY CONSUMPTION AND RESIDENTIAL
BUILDING DESIGN IN LAGOS METROPOLIS**

BY

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**A THESIS SUBMITTED TO THE DEPARTMENT OF
ARCHITECTURE IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF
DOCTOR OF PHILOSOPHY (PhD) IN ARCHITECTURE OF
THE UNIVERSITY OF LAGOS.**

April, 2017

DECLARATION

I HEREBY DECLARE THAT I AM THE SOLE AUTHOR OF THIS RESEARCH PROJECT AND THAT IT HAS NOT BEEN PRESENTED BY ANY PREVIOUS APPLICATION FOR A HIGHER DEGREE.

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.....

Kusimo, Moshood Abiodun

April, 2016

DEDICATION

This work is dedicated to Almighty ALLAH to whom all glory and adoration belongs, for his infinite mercy and grace upon me.

I also wish to mention my parents – late Rabiū Kusimo and Mrs Moninuola Kusimo for their belief in me, I owe them eternal gratitude for believing that I could make it in all my chosen life's venture.

ACKNOWLEDGEMENTS

My immense gratitude goes to my supervisors Professor Mike Adebamowo, Professor Leke Oduwaye and Dr. A.K Adebayo for their incredible effort, encouragement and painstaking advice and support throughout the duration of this research. I am also grateful to Professor R. Iyagba, Professor Bayo Amole and Dr.Dolapo Amole. Thank you very much for for putting me on the right path when I veered off the road to success. You all gave me invaluable advice and encouragement, I appreciate you.

I am also grateful for the assistance and mentorship of all members of staff in the Department of Architecture, University of Lagos- Professor Olumide Olusanya, Professor J.M.Igwe, Professor Niyi Okedele, Dr. M.B.O. Adegbile, Dr. Tony Iweka, and Dr. Nnezi Uduma – Olugu, for your encouragement and support, thank you.

My special thanks to Mr. M.B. Olufowobi, Associate Professor Department of Building, University of Lagos, Dr.Agunbiade, Dr.Tunji Adejumo for their immense and timely assistance, suggestions and valuable material contributions. God bless you all.

I wish to also acknowledge contributions and supports from Lekan Adegbite, Toyin Ayinde, Taiwo Adeoluwa, Abiodun Agbaje, Dr. Lateef Odekunle and Azeez Ayorinde for their understanding and efforts in typing of this work.

Finally, I wish to express my sincere gratitude to members of my family: my wives' Abibat Kusimo and Fausat Kusimo; my children Ibrahim, Tawakalt, Ganiyat, Arafat and Aminat, for their perseverance and co-operation during the course of this research.

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ABSTRACT

The use of energy has raised concerns over the problem of supply and exhaustion of the resources. In developing countries, particularly in Nigeria, the rate of energy consumption has been increasing rapidly due mainly to population growth, urbanization and development of infrastructures in recent time. The International Energy Agency (IEA) frightening annual energy use growth projection of 3.2% by emerging economies, with the expectation to exceed developed countries consumption, makes it inevitable, the future use of sustainable energy consumption in residential buildings. This research therefore aims at investigating energy consumption in Residential buildings in order to develop a viable model for projecting the energy consumption with different design parameters in Lagos metropolis. To this extent, extensive reviews on various building elements characteristics, identification of energy use indicators, environmental factors and occupant behavioural actions on household's energy consumption were examined. Field survey was also carried out in order to identify, investigate, and determine variables effects such as design building characteristics, environmental thermal factor, human comfort requirements, access and use of building control mechanism among others. The research covered the Sixteen Local Government Areas found in the Metropolis of Lagos. The population considered in this study was derived from two main groups which comprise Public and Private Housing units. On this score, a random sampling technique was employed in selecting the sample required in this study. It is as a consequence of this that questionnaires, personal interviews and secondary data were utilized in collecting relevant data. The data were subjected to careful analysis using Chi-Square test, Spearman Correlation (ρ), Pearson product moment correlation (r) and forward stepwise regression analysis. The data analysed revealed that what primarily determines energy consumption in the residential buildings considered can be traceable to seven significant variables which includes Environmental Outdoor Relative Humidity, Total Glazed External Area, Environmental Indoor Temperature, Building Envelope Area, General Glazing sizes, Building Cooled Floor Area and Environmental Indoor Relative Humidity. This prompts a major conclusion in this research that what is responsible for energy consumption in Lagos Metropolis is the relationship between Planning layouts and Building Characteristics in the control of both internal and external environmental conditions. Therefore, the research recommends that the knowledge of Architectural sustainability be encouraged in training Architects and Planners on energy use and management of energy resources in different climatic zones in Nigeria.

Keywords: Energy consumption, Energy indicators, Building characteristics, Environmental thermal factors and Thermal Behaviour.

