Edited by
Abubakar Danladi Isah
Isa Bala Muhammad

Measure of People and Space Interactions in the Built Environment

Towards Responsive Development

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Foreword

This is a book that took me completely by surprise for two main reasons; first it concerns a subject matter that is not for the casual reader because it is complex and intangible, and secondly and more importantly it is by a group of Nigerian doctorate holders who graduated less than 5 years ago. In the Nigerian context this is extremely unusual and unprecedented. Every year I suspect hundreds if not thousands of Nigerians are awarded doctorate degrees from home and abroad which end up in library shelves and whatever knowledge these contain are lost to Nigeria and Nigerians. While some of these works never get disseminated because the researchers may not consider them much to write home about, others never get to see the light of day because the researchers simply never inculcated the academic spirit. Yet many of these works are extremely good and contain insights that could lead to breakthroughs in many fields. In addition, they could serve as inspiration for many researchers old and new. It is in this light that this book deserves praise and admiration. Here is a group that is thinking out of the box, that have started publishing their research works even before the ink on their doctorates is dry.

The focus of the book is, 'people and space interactions in different settings'. Each of the seven chapters of the book touches on one aspect or the other of this vast field. The book deals with cultural landscapes, sustainable housing settings, the environment and human response, spatial epidemiology, neighbourhood and health, and the subjectivity-objectivity continuum in man-environment research. From the foregoing, it is obvious that various disciplines are touched and those to benefit from the work include, but not restricted to scholars of geography, anthropology, sociology, urban planning, architecture, and above all environment-behaviour studies.

What is unique about the work is not the number of disciplines touched upon nor the numerous subject matters but what unites these diverse issues besides the focus on human relationship and response to the environment, and that is most of the authors are architects. The reason is simple; architects at least in Nigeria if not in Africa tend to downplay the academic aspects of architecture and over-emphasise the practical aspect of design. The end result is that architecture in Nigeria lacks theoretical depth and consequently, it tends towards an architecture without élan vital or panache. Thus, the book should be a demonstration of the possibility of uniting theory and practice in the profession of architecture. Furthermore, it is a first step toward focusing on an architecture for the people at least, if not by them or of them; how it is

read, how it is interpreted and how meaning can be made out of a subject matter that can be complex and even complicated.

In conclusion, one would like to state that the form and hence the orientation of the people and space interactions may differ but the underlying structure and hence the function remain valid for all the cases here. All one needs is the ability to see beyond the form and the orientation of the different approaches to the importance of the structure and the universals which could lead to the basis for drawing meanings in comparisons.

A. A. Muhammad-Oumar
Bayero University, Kano
KANO October 2017

Preface

Research contributions relating various aspects of research methodology abound in several disciplines. However, research methodologies related to specific phenomenon in several disciplines are rare. The essence of this book is to identify and fill such gap by relating appropriate scientific structure of inquiry with respect to certain phenomena in the built environment.

Significantly, the methodological framework presented in the various chapters of this book relates to the Sustainable Development Goals advocated by the United Nations. It also aligns with the United Nations' concept of sustainable development of physical landscape and living spaces as inhabitants interrelate with their settlements.

The book concentrates on the "Measurement" approach- which involves identification of variables relating people and space, as well as applying principally suitable data sources and analyses methods in order to develop an "Assessment" tool- for performance evaluation based on existing criterion or established criteria.

Thus, this book contributes towards an appropriate approach in measuring people and space interactions in different settings that include tourist wellbeing in a typical hilly landscape, disease management patterns with spatial structure in urban neighbourhoods. Others are healthcare facilities, housing studies and cultural landscape of typical ethnic settlement. All these aforementioned examples of people-space interactions are subsumed into a collection- towards projecting appropriate path for researchers interested in mainstream values of people and their environment. Most importantly is that each chapter made up of different studies which related people and space transactions in resolving global challenges of sustainable and responsive habitations in both urban and rural environments. Apart from targeting researchers and professionals in the built environment, this book may appeal to sociologist and anthropologists.

Abubakar Danladi Isah PhD Minna, Nigeria 2017

Chapter contributions

Chapter One

This book is an attempt to introduce various research methods and strategies that can be used in social research, taking human interaction with its environment as its main focus. The inclination of research towards various levels of objectivity or subjectivity opens up room for discussion on how social research that involves human as subjects can belong to almost any level in the continuum. That is quite a significant contribution in a way that social researchers continue to get support and feel confident to break free from obliging strictly to total objectivity or subjectivity.

Tareef Hayat Khan PhD

Universiti Tecknologi Malaysia

Chapter Two

So far, no previous study has investigated the restorative benefits of contact with mountain landscape environment. Therefore, extensive research remains to be carried out in the investigation of the mechanism and intricacies of the link between restorative environments, human response and wellbeing. Hence, a synergetic approach in the measurement of the psycho-physiological responses of individuals within a real-life multi-stimulus mountain landscape environment is required. This is in order to further extend research in the environment and human well-being domain.

Henry Ojobo PhD

Kaduna State University, Kaduna, Nigeria

Chapter Three

The neighbourhoods with negative parameter estimates of diseases are in the areas with significant t-values which indicate the influence of urbanization. This is because the influence of urbanization on Meningococcal meningitis, for instance, is on the inverse, implying that the less the urbanization, then the more the influence of the disease in those neighbourhoods. Thus, having an understanding of the spatial and temporal changes of diseases and categorizing the spatial structure was the central point of this chapter more so the importance of spatial structures of diseases for health planners as the population interact with their environment.

Emmanuel Umaru Tanko PhD

Federal University of Technology Minna, Nigeria

Chapter Four

The combination of several strategies in investigating patient and family relationship demonstrates that various methods are used in different fields of study and can fuse together towards building a framework for another scientific inquiry. The sequential and parallel order by which such investigation is scheduled shows some rigour in the approach used for data elicitation. Most importantly, findings evolving from such process are valid and reliable due to its multi-dimensional trail.

Ibrahim Abubakar Alkali PhD

Bayero University Kano, Nigeria

Chapter Five

Systematically, sustainable housing research better combines various settings as a result of diverse human and ethnic commonalities while seeking the understanding of physical setting and inhabitants' behaviour. The operational methodology appropriate is a qualitative research that adopts a multi-case studies strategy, with multi-phase sampling technique using a mixed-method approach in data eliciting and processing as well as in the interpretation.

Abubakar Danladi Isah PhD

Federal University of Technology Minna, Nigeria

Chapter Six

Cultural landscape study showcases the extensive step by step process involved in the elicitation of cultural landscape values of communities. These, amongst others, include the formation of rapport with the study community, the use of multi-method approach in the elicitation of data about the indigenous people upon which the bedrock of the information was ethnographic. The ethnographic process allowed for data to be gathered and understood through the perspective of the indigenous people.

Isa Bala Muhammad PhD

Federal University of Technology Minna, Nigeria

Chapter Seven

The scientific procedure for conducting research in people and space transactions is characterised with a plethora of approaches which most of the time could be confusing especially to a beginner researcher. This book significantly provided measures of people and space interactions in the built environment towards responsive development. It covers the consideration of different

settings of the built environment that include mountainous landscape, urban neighbourhood, hospital built environment, public housing setting and cultural landscape of a typical rural ethnic community. These settings are influenced by culture and technology in space optimisation, linking urban dynamics with mainstream indigenous cultural values in both tangible and intangible expressions. In this regard, researchers move towards thinking out of the box and identifying appropriate methodology, which means they encounter new innovative and creative methodologies that better fit the phenomenon under investigation.

Isa Bala Muhammad PhD

Abubakar Danladi Isah PhD

Federal University of Technology Minna, Nigeria

About the book editors

Abubakar Danladi Isah PhD

Abubakar Danladi Isah was awarded a PhD in Architecture by the Universiti Teknologi Malaysia. He also holds a bachelor's honour degree in Architecture and a master's degree in the same discipline from the Federal University of Technology Minna, Nigeria. He is a registered architect and has practiced for several years engaging in housing and institutional buildings' design and construction. With several years of teaching experience, he has worked as a visiting lecturer and facilitated research inputs in many universities. He has written several journal articles, a book chapter and has authored the book, 'Urban Public Housing in Northern Nigeria: The Search for Indigeneity and Cultural Practices in Design'. His research interests include space use and human behaviour, building and culture, sustainable housing, research methods, and ethics and moral reformation.

Abubakar Danladi Isah is also a reviewer for several local and international journals, conferences and an Editorial member of the Archi-Culture Journal at the University of Jos, Nigeria. He has attended training courses in human ethics and peaceful co-existence which qualify him as a human moral reform consultant. Thus, his academic and practical experience in leadership and participation in public presentations has allowed him to fully understand how people interact with and understand their environment.

Isa Bala Muhammad PhD

Isa Bala Muhammad obtained his PhD in Architecture from the Universiti Teknologi Malaysia and was the recipient of the best graduating PhD student Award in the Department of Architecture in 2015. He received his Master's Degree as well as Bachelor's degree in architecture in 2000 and 2002 respectively from the Federal University of Technology Minna, Nigeria. He joined the services of the Niger State government as an architect in 2003 where he designed and supervised several projects and later rose to the position of senior architect. He later joined the Federal University of Technology Minna as a lecturer in 2007 and has lectured and supervised both undergraduate and post-graduate students. He has written several research articles and a book, on cultural landscape. His research interests are Ethnography, Cultural landscapes, Ecosystem Services & Human Behaviour, and Environment.

Isa Bala Muhammad is a reviewer of University-based journals including the Pertanika Journal of Science and Technology, Universiti of Putra Malaysia; the Archi-Culture Journal, University of Jos Nigeria and the Nigerian Journal of Technological Research, Federal University of Technology Minna. He is also an Editorial member of the Environmental Technology and Science Journal at the Federal University of Technology Minna. Additionally, he is a registered member of Teachers Registration Council of Nigeria and Architect's Registration Council of Nigeria.

Chapter 1

Introduction

Tareef Hayat Khan

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Adoption of a suitable scale of measurement in the evaluation of a research phenomenon is significant in determining the validity and reliability of the process as well as its outcome. Systematically this book focuses on the scientific procedure of some selected phenomena in people and space transactions in the built environment. Remarkably, the development of the chapters is guided by the focus on sustainability and responsiveness of research process and outcomes in order to enhance global and contextual goals of UN sustainable development goals (SDGs). Therefore, the book presents methods and research focused on appropriate measures geared towards sustainability in the benefits of human interactions with both their indoor and outdoor (space and landscape) environments with regards to the consideration of mainstream values in ensuring liveability and sustainability in an urban environment. Consequently, a multi-dimensional strategy seems to be appropriate in measuring the relationship and interaction between inhabitants and their (urban) environment.

Research is about a systematic approach to solve problems. Research outcomes are aimed at contributing to human wellbeing. When the methods of achieving research outcomes are documented comprehensively it not only provides help to other researchers to replicate it in order to gain same or similar outcome, perhaps in a broader scale, but it also provides a basic platform for further research into that particular or similar issues. Proper documentation of research methods and its inherent strategies also provide new researchers to challenge an outcome in one way, or to reinforce the method in another way. It is all about transparency so that researchers around the world can take help from fellow other researchers as much as possible and can act as a single community aiming for that same goal – contribute to human wellbeing.

However, methods vary from research to research depending on the ontological differences. The research topic can provide the researcher with the first question: Which paradigm do I belong to for this research? This is because the research methodology and the subsequent developed strategies are easier to be determined when a paradigm is chosen for research. While there are positivist and interpretivist paradigms on the two extremes that are traditionally supported by quantitative and qualitative methods respectively, modern researchers argue that in any paradigm, methods can be mixed, which infers that different objectives in the research might adopt different quantitative and qualitative methods and strategies in order to achieve the aim of the research. In a way, it liberates the researcher not to be forced into quantitative or qualitative methods strictly along the whole journey of the research. In another way, it also acknowledges the limitations of both methods in order to address the reality. The reality itself can, therefore, be recognized as neither total objectivity nor total subjectivity, but somewhere in between. It may not be comfortable for all researchers, but for social researchers, where humans are the subject matter, most probably that kind of reality is acceptable. It is not only because every human subject is different, and therefore, a total objective reality is absolutely unattainable, but also because the researcher is also a human being, and probably susceptible in interpreting outcomes in a way that can be acceptable to every reader. Therefore, 'probability' plays a very important role in social research. Depending on the research topic, the probability of the acceptance of research outcomes may be higher or lower. That is why the research methodology becomes more important for social research as more transparency can lead to more acceptability, or at least can lead to fair criticism.

Focusing on the research topic of this book in which human interaction with its environment is the ontological domain, there could be different research areas that are inclined to different levels of Objectivity and Subjectivity. Relating quantitative methods with objectivity and qualitative methods with subjectivity, Morgan and Smircich (1980) tried to show how research approaches can belong to a range in a continuum, rather than simple discretely identifiable levels. Joroff and Morse (1984) even showed which types of research could lie on which particular range in a subjective-objective continuum. That opened up the debate even more nicely for social research, and allowed social researchers to try different methods to different extents, and let the skill and stance of the researcher to convince the reader about the outcome of the research to be acceptable in the bigger knowledge base.

While arguably more scientific, and hence, more quantitative methods such as laboratory experiments could be used to study human interaction with environmental factors (example: as daylight, heat, etc.), pure qualita-

tive methods such as ethnography are preferred to study cultural factors (example: human behaviour, cultural traits, etc.). Considering these at almost two extreme ends for research topics related to human interaction with its environment, in between may lie many research areas which might demand a varied level of objectivity and subjectivity. It is important for the researcher to understand which research area should belong to which level in the continuum. Therefore, the idea of putting together five different research topics in this book where these five lie on different levels in that continuum was definitely interesting.

The methods used to measure the human wellbeing in Mountain landscape environment clearly adopted the quantitative methods as stated in the research methodology. However, all the parameters were not purely quantifiable. For example, even though mountain environment (that include river, forest, waterfall, etc.) could be clearly defined, the ambient environment conditions that include temperature, humidity, etc.) could be quantifiable, and even human physiological responses (that include blood pressure, pulse rate, respiratory rate, etc.) could be quantifiable, human psychological perception (that include stress, excitement, calmness) were not. That created room for subjectivity in this research, especially while establishing relationships between the variables. Therefore, one can assume that this research belongs to somewhere in the middle of the continuum, and though not at the objective end, it may be more inclined towards that direction.

The study of control and management of epidemics through spatial statistical analysis is another good example to investigate a subjective research area with a more objective research tool. The parameters were quite measurable, for example, the location of the hospital, location of the refuse dump, the house conditions, population's density, ownership pattern, etc. However, the tools used such as Getis and Ords hot spatial analysis, Geographically Weighted Regression, and Spatial Pattern Analysis are based on statistical probability. Moreover, the sample collection method might also have had significant level of subjectivity, and therefore, this research could well belong close to the middle of the continuum, even though there are efforts to incline it towards objectivity.

The research on designing strategy for inpatient wards by examining hospital spaces and family care action has adopted self-proclaimed qualitative methods, where the researcher depended on interactive interviews and observation for data collection. Behaviour mapping technics were qualitative methods of analysis, and intense logical argumentation was necessary to justify the outcomes. The outcomes, in this case, were design strategies, which were also qualitative in nature. Moreover, the researcher's background might also have significantly affected the argumentation. However, the research topic gave room to generalize the findings, as health care strategies have been standardized to a certain

extent throughout the world. Therefore, even though qualitative methods were adopted, the research does not necessarily belong to the extreme end of subjectivity in the continuum, though more inclined towards that direction, and most probably in a balanced situation near the middle.

The final two topics by their titles indicate to belong in the subjective half in the continuum. In Chapter 5, determining cultural attributes of a particular community was the foremost task of the researcher which is hard to be based on any quantitative methods. The methods included participant observation, Gamma diagram, Qualitative Factor Analysis at different stages of data collection and analysis. These are all qualitative in nature. Thereafter, using the cultural attributes in order to determine the culture responsive design needed strong context specific background of the researcher, as well as a long-term involvement with the community. The findings, therefore, tend strongly towards the subjective end in the continuum.

In Chapter 6, the significant parameters that were measured were cultural values and community values. There are purely qualitative in nature, and very difficult to generalize. The method was ethnography, where the researcher needed to stay with the community for a considerable time period in order to convince the reader that all the parameters of the research had been comprehended at a significant level. Therefore, validation of the research becomes less important, and trustworthiness becomes more significant. That is why the research became inclined to the subjective end very distinctively.

Therefore, this book is an attempt to introduce various research methods and strategies that can be used in social research, taking human interaction with its environment as its main focus. Their inclination towards various levels of objectivity or subjectivity opens up room for discussion on how social research that involves human as subjects can belong to almost any level in the continuum. That is a quite significant contribution in a way that social researchers continue to get support and feel confident to break free from obliging strictly to total objectivity or subjectivity.

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