

**RIVERS STATE UNIVERSITY,
PORT HARCOURT**



THE LAND USE AND VALUE NEXUS

AN INAUGURAL LECTURE

By

**PROFESSOR
IYENEMI IBIMINA KAKULU**

B.Tech.; M.Sc.; PhD; FNIVS

Professor of Land Management and Valuation



SERIES NO. 65

Wednesday, 30th October 2019

Notes

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TABLE OF CONTENTS

		PAGE
	LIST OF FIGURES	-
	PROTOCOLS	- 1
	PREAMBLE	- 1
1	INTRODUCTION	- 2
2	CONTEXTUALIZATION - AGENDA 2030 AND 2063	- 4
	2.1 United Nations Agenda 2030	- 4
	2.2 The African Union Agenda 2063	- 5
3	LAND USE AND VALUE RELATIONSHIP	- 7
	3.1 Highest and Best Use Concept	- 7
	3.2 Land Abuse	- 8
	3.3 Land Misuse	- 8
	3.4 Land Underuse	- 9
	3.5 Land Overuse	- 10
4	STREET CRIME AND PROPERTY VALUES	- 10
	4.1 Housing, Street Crime and City Regeneration	- 10
	4.2 Variation in Crime and Property Values	- 11
5	ENVIRONMENTAL POLLUTION AND RESIDENTIAL PROPERTY VALUES	- 13
	5.1 Occupant health and Property Use	- 13
	5.2 Indoor Air Quality & Residential Property Use	- 14
6	GOVERNANCE AND LAND USE	- 15
	6.1 Weak Governance and Land Values	- 15

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	6.2	Ancestral Land Boundaries & land use conflicts	- 16
	6.3	Traditional Land Delineation and Property Value	- 16
7		PROPERTY CONSTRUCTION, MAINTENANCE AND VALUE NEXUS	- 18
	7.1	Building Maintenance Management	- 18
	7.2	Construction Patterns and Property Value	- 19
	7.3	Wetland Construction and Property Value	- 20
8		EXPROPRIATION OF LAND AND VALUATION FOR COMPENSATION	- 21
	8.1	Compensation and Property Value	- 21
	8.2	Principles of Compensation	- 23
9		RIGHTS-OF-WAY AND DEVELOPMENT LAND VALUE	- 24
	9.1	Pipelines and Property Development in Greater Port Harcourt	- 24
	9.2	Pipelines and Urban Development	- 24
	9.3	Pipelines Locked Land	- 26
	9.4	The Spider's web as an Intervention Model	- 27
	9.5	Developing the radians and spirals	- 29
10		LAND DAMAGE AND COMPENSATION	- 30
	10.1	Compensation Rates Research	- 31
	10.2	Heads of Claim and Compensation	- 33
	10.3	Odi Disaster and Reconstructive Valuation	- 34
	10.4	Post Impact Surveys & Compensation Valuation	- 35
11		LAND USE AND MARINE POLLUTION	- 37
12		COLLABORATION IN DAMAGE ASSESSMENT SURVEYS	- 40

12.1	Technical Collaboration Benefits	- 40
12.2	Land Access in the UNEP Ogoniland Study	- 41
12.3	Land Access Strategy and the UNEP Ogoniland Project	- 42
12.4	Farmers Perception of Reasonable Compensation	- 43
13	OTHER CONTRIBUTIONS TO RESEARCH AND DEVELOPMENT	- 44
13.1	ICT in Real Estate Practice in Nigeria	- 44
13.1.1	Teaching of Computer Applications to Real Estate in Nigerian Universities and Polytechnics	- 45
13.1.2	Computer Appreciation Training for Estate Surveyors and Valuers.	- 45
13.2	Mainstreaming Environment and Sustainability in Higher Education	- 46
13.3	MSc. Estate Management - Land Management and Sustainable Development Option	- 47
13.4	Qualitative Research Methods in Real Estate	- 47
13.4.1	Phenomenological Research	- 48
13.4.2	The Bowtie-Butterfly (BB) Model Development	- 49
14	CURRENT RESEARCH FOCUS	- 54
14.1	TETFund Contaminated Land Valuation Research-	54
15	CONCLUSION - BEYOND THE NEXUS	- 56
	Acknowledgments	- 58

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FIGURES		PAGE
Figure 1	- Model of the Spider's Web Development Pattern. Source: Kakulu (2012:766)	- 26
Figure 2	- Pipeline positions in the study area in Igbo-Etche. Source: Kakulu (2012:767)	- 28
Figure 3	- Proposed New Road(s) made up of Radians and spirals (Source: Kakulu, 2012:767)	- 30
Figure 4	- Untreated Sewage Discharge and Ogujagu - October 2008	- 39
Figure 5	- Bowtie-Butterfly Analytical Model - Induction	- 51
Figure 6	- Bowtie-Butterfly Model - Inductive and Deductive Analysis	- 52
Figure 7	- Data matrices for the Forward and Backward Pass. Source: Kakulu (2008)	- 53

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PROTOCOLS

The Vice Chancellor (Ag.)
 Registrar and other Principal Officers,
 Provost of the College of Medical Sciences,
 Dean of the Postgraduate School,
 Deans of Faculties and Directors of Institutes,
 Heads of Departments,
 Distinguished Professors and Emeritus Scholars,
 Staff and Students of the Rivers State University,
 Distinguished Chiefs, Ladies and Gentlemen

PREAMBLE

This inaugural lecture is presented with a deep sense of humility and extreme gratitude to God for making all things beautiful in His time. It documents snippets of my intellectual and professional curiosity over the last three and a half decades and describes my trajectory towards becoming the first and only Professor of Land Management and Valuation in Nigeria, in October 2017 to the glory of God.

My Land management and valuation journey reveals a passion, interest and focus on different aspects of the multi-faceted phenomenon called land. Some of my specialties cover issues that deal with land use, land abuse, land misuse, land underuse and land overuse. In the last thirty-four years, I have participated in several academic and professional activities which include research, teaching, presentations at local, national, regional and international

conferences, workshops and expert group meetings and professional consultancy projects that address land use and land value.

My elevation to the rank of full Professor of Land Management and Valuation in October 2017 opened a new chapter and birthed the NEXUS. This lecture tagged '*The Land Use and Value Nexus*' describes the connection between land use, abuse, misuse, underuse and overuse on one hand, and land value on the other. It presents the contributions that I have made to the development and strengthening of the Nexus and its role in the future of land value growth in Nigeria. It highlights the need for a sustainable approach to land management that seeks to ultimately enhance the economic and social value of land at all times.

The Ag. Vice Chancellor, Professor Opuenebo Binya Owei, I am delighted to present this inaugural lecture entitled The Land Use and Value Nexus, to this very distinguished audience. I do hope that the issues presented in this lecture will contribute towards Sustainable Land use and the growth of the land sector in Nigeria.

1. INTRODUCTION

Land holistically refers to natural resources such as soil, water and living organisms. It possesses certain qualities which make it unique such as ownership rights, boundary delineations, resource availability, institutional frameworks and socio-economic environments surrounding the land. The environmental components (ecological and biodiversity considerations) are also key components of land. Land is a complex issue with definitions encompassing subsisting interests which might be held over a parcel of land as well as its physical description in terms of its geographical location. It includes resources above or below the land. Whatever the definition, land is a resource which can be put to beneficial use. It can also be abused, misused, underused and overused with possible

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Professor Kakulu has served in several academic and professional capacities. She served on the Estate Surveyors and Valuers Registration Board of Nigeria (ESVARBON) from 2000 -2003 and 2013-2016. She served as Honorary Chief Executive of the Nigerian Institution of Estate Surveyors and Valuer's learning Centre from 2012 -2016.

She has been a member of the Governing Council of the Rivers State University (2006), Ken Saro - Wiwa Polytechnic from 2008-2012 and 2014-2015. Prof. Kakulu is currently a member of the Rivers State University Teaching Hospital Board and the Pioneer Director of Quality Assurance of Rivers State University.

She is married to Engr. Laurie Kakulu and they are blessed with four children and one granddaughter - the beautiful Ilona.

consequences of degradation or complete destruction of not just the physical aspect but also the bundle of rights associated with it. Land provides a base for agricultural production, mineral extraction and real estate development amongst other uses.

Within the context of the Estate Management Profession, land is seen as natural capital with great potentials which can be harnessed through careful planning and the injection of human and financial resources, transforming it to higher valued lands. Unfortunately, land is usually not always subjected to its optimum use and suffers abuse and misuse by the citizenry at large. Land can also be misused where the concept of highest-and- best use is ignored resulting in prime lands being used for activities that could otherwise thrive in lower value areas and vice versa. The land use and value nexus explore the relationship between beneficial land use and non-beneficial land use. It also addresses the spinoffs associated with non-beneficial land use such as compensation.

Land also refers to development upon the land in the form of real property or agricultural property. Atmospheric and aquatic resources adjacent to land form part of the characteristics of such land. The ecosystem support and provisioning services are also a major component of the land itself. There are several concepts associated with land and for completeness of this lecture, a few of them are discussed in subsequent sections. The main thrust of this lecture however not a treatise on land but an attempt to highlight the nexus, the regulatory role that effective land management policies and practices can play in managing land use and monitoring land value trends in order to ensure that sustainable land value profiles are maintained in both urban and rural lands as much as possible.

2 CONTEXTUALIZATION - AGENDA 2030 AND 2063

This lecture is contextualized within two main protocols, the United Nations Agenda 2030 and the African Union Agenda 2063. In 1987, the United Nations Conference on Environment and Development (UNCED) released a report - our common future commonly called the Brundtland Report. This report included what has become one of the most widely used definitions of Sustainable Development which is 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. (UNCED,1987). Sustainable Land Management (SLM) emerged from this process. There are social and institutional, economic and ecological dimensions to SLM.

2.1 United Nations Agenda 2030

The year 2016 ushered in the official launch of the United Nations (UN) bold and transformative 2030 Agenda for Sustainable Development adopted by world leaders in September 2015 at the United Nations Assembly. The new Agenda consists of 17 Sustainable Development Goals (SDG's) and 169 Targets which are our shared vision of humanity and a social contract between the world's leaders and the people. Goal 15 of the SDG's is dedicated to life on land with a sole objective which is to sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss. Goal 15 serves as a blueprint for collective effort towards achieving Sustainable land management in Nigeria commencing at the grassroots and it has 12 Targets. Five of these targets that are of interest which are due to have been achieved by the year 2020, are as follows:

1. By 2020, ensure the conservation, restoration and *sustainable use* of terrestrial and inland freshwater

CITATION



Professor Iyenemi Kakulu Ibimina (nee Horsfall) commenced her academic career in 1985. Following an outstanding performance during her final year project defense, the external examiner Emeritus Professor John A. Umeh wrote a recommendation to the Vice Chancellor that she be employed as a Graduate Assistant.

While on her National Youth Service programme she was invited by the Rivers State University to an interview for the position of a Graduate Assistant in July 1986. Unfortunately, although she was present at the venue of the interview, she without being interviewed as she was scheduled to lead the NYSC passing out parade the following day back in Owerri, Imo State.

During her NYSC, she lectured at the College of Technology (now Federal Polytechnic, Nekede) Owerri between 1985 and 1986 and proceeded to the University of Reading, in the United Kingdom for postgraduate studies. She obtained a Master's Degree in Urban Land Appraisal in 1987 and returned to Nigeria to take up her appointment not as a graduate Assistant but as an Assistant Lecturer in June 1988. In 2008, she obtained a PhD in Real Estate and Planning from the prestigious Henley Business School, University of Reading. Professor Kakulu is a Fellow of the Nigerian Institution of Estate Surveyors and Valuers and a Registered Estate Surveyor and Valuer.

Thanks to the President and members of the Nigerian Institution of Estate Surveyors and Valuers and the Estate Surveyors and Valuers Registration Board of Nigeria for giving me an opportunity to contribute to the development of Estate Surveying and Valuation.

To my friends Capt. Kehinde, Pastor Yaabari, Senator Osy Ideozu and my sisters for life Ekanem, Onoye, Tata, Enenibiyo, Thelma, Iquo, Boma, Faustina, Jumoke, Douye, Otelemari and Lizzy.

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ecosystems and their services, forests, wetlands, mountains and drylands, in line with obligations under international agreements.

2. By 2020, promote the implementation of *sustainable management* of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.
3. Take urgent and significant action to *reduce the degradation* of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.
4. By 2020, introduce measures to prevent the introduction and significantly *reduce the impact of invasive alien species on land* and water ecosystems and control or eradicate the priority species.
5. By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts.

With just 1 year to go on these targets, how has the country fared? What are the achievable landmarks to be presented at the mid-term evaluation of the SDG's in 2020?

2.2 The African Union Agenda 2063

The African Union Commission Agenda 2063 is a strategic framework for the socio-economic transformation of the African continent over a 50-year period commencing in 2013. It reveals the desires of the leaders of the African Union General Assembly and consists of 7 major aspirations. *Aspiration 1* of Agenda 2063 desires a prosperous Africa based on inclusive growth and *sustainable development*. It states that Africa shall be a prosperous continent, with the

means and resources to drive its own development, with sustainable and long-term stewardship of its resources where:

Africa's unique natural endowments, its environment and ecosystems, including its wildlife and *wild lands are healthy, valued* and protected, with climate resilient economies and communities. *Aspiration 6* seeks an Africa whose development is people-driven, relying on the potential of African people, especially its women and youth, and caring for children where: the African woman will be fully empowered in all spheres, with equal social, political and economic rights, including the ***rights to own and inherit property***, sign contracts, register and manage businesses. Rural women will have ***access to productive assets: land***, credit, inputs and financial services. African Leaders adopted Agenda 2063 as a collective vision and roadmap for the next fifty years and a commitment to speed-up actions to, amongst other things provide opportunities for all Africans to have decent and affordable housing in clean, secure and well-planned environments by:

1. Providing access to affordable and decent housing to all in sustainable human settlements;
2. Ensuring effective and territorial planning and ***land tenure, use and management systems***;
3. Ensuring balanced development of all human settlements while embracing a rural urban continuum; and,
4. Improving the livelihoods of the great percentage of the people working and living in slums and informal settlements.

My wonderful In-Laws Madam Nelly Kakulu, Sir and Lady John and Carm Kakulu, Mr. and Mrs. Ambassador Briken, Barr. and Mrs. Oje Kakulu, Dr. Florence Kakulu and Maxwell Kakulu.

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The issues of sustainable land use are both global and regional in outlook and partner nations are expected to take strategic action towards the actualization in their nations. It is collective responsibility involving all stakeholders and for which the land management professionals should play a leading role. The Nexus is poised to contribute to this global and regional dream through research and development.

3 LAND USE AND VALUE RELATIONSHIP

Professional Estate surveyors and valuers are, through a process of academic and professional training, unable to view land from a simple perspective as merely a physical object. Their training makes this unique professional view land as a bundle of untapped potentials waiting to be harnessed and stirs in us a sense of duty to contribute towards that process. There is a connection between land use, land abuse, land misuse, land underuse and land overuse on one hand, and the corresponding patterns of land values and trends on the other. This lecture would be incomplete without highlighting the circumstances that necessitate effective management of land use. By re-enacting some of the activities that I have embarked upon in my thirty-four-year academic journey, I briefly explain some of the terms that will be used interchangeably during the course of this lecture.

3.1 Highest-and-Best Use Concept

Valuers are trained to systematically predict the future income profile of landed property based on a series of subjective and objective considerations, assumptions, and forecasting skills to arrive at that futuristic value and thereafter discounting this future value to present day reality - a process aptly described as valuation. Valuation is however beclouded with risk and uncertainty which is more pronounced in unstable economies where data for development is lacking. Valuers need to as

much as possible, take proactive steps to ensure that sustainable land use and management policies are always in place to protect landed property investments and ensure that every parcel of land is put to its highest-and-best use. The variables upon which property valuation computations are made, can change at any time and render a professional valuer's opinion and expression of value faulty. A slight change in lending rates, construction or maintenance costs, proliferation of non-complimentary land uses around previously reserved layouts, can interfere with landed property value and should be avoided. Nexus thinking is essential if the concept of highest-and-best is to be achieved.

3.2 Land Abuse

Land abuse is characterized by carrying out activities on land that destroy its pristine state resulting in degraded or damaged lands. The Nexus here is simple, land abuse leads to land degradation and land degradation leads to land value diminution. By land abuse we also refer to land that has been used for a bad purpose such as crime, regularly. If land could speak it would cry foul and object to the treatment it has been given in the area of environmental sanitation, oil pollution, sporadic and uncontrolled development and many more presented in subsequent sections of this lecture. There are notable examples in several parts of the city of Port Harcourt where previously residential areas have now become night club zones and quiet neighbourhood's now suffer uncontrolled noise pollution from places of worship.

3.3 Land Misuse

Human induced land-use changes are among the major drivers of biodiversity loss and landscape fragmentation. Land degradation is caused primarily by the misuse of land and an examination of the causes of land misuse is essential if

2. The **Nexus** will seek to promote the development of a Centre for excellence in Land Management and Valuation that will attract research grants to conduct local and regional research on land use, abuse and misuse with the objective of developing economic instruments to deal with such issues.
3. The **Nexus** will seek to influence policy development that promotes the application of Sustainable Land Management tools in land use allocation activities and a corresponding army of sustainable land management crusaders.

15. CONCLUSION - BEYOND THE NEXUS

The Nexus as you might have deduced by now, is in the person of Professor (Mrs) Iyenemi Ibimina **Kakulu**. She was first presented by her elevation to the rank of an Associate Professor (Reader) in Land Management and Valuation in 2013, by the Vice Chancellor, Professor Barineme Beke Fakae. This elevation was in recognition of her trajectory within the land management and valuation research field and marked the beginning of a new area of budding research niche which focusses on contaminated land valuation of hydrocarbon contaminated farmlands.

The Nexus crystalized following her elevation to the rank of full Professor of Land Management and Valuation by the Vice Chancellor, Professor Blessing Chimezie Didia in October 2017, which now provides her with the much-needed platform and voice to upscale the issue of land use, abuse, misuse, underuse and overuse in Nigeria, West Africa and on the African continent. The NEXUS will seek a future for Nigeria and Africa with land degradation neutrality thinking. This will be achieved by undertaking the underlisted activities:

1. The **Nexus** will seek to develop academic and certificate level programmes that address Sustainable Land Management (SLM) for enhanced landed property values. The target audience will include the built environment and land management professionals in the public and private sector. The current MSc Estate Management option on Land Management and Sustainable Development will be upscaled to a full independent Professional Masters in Sustainable Land Management for policy makers.

lasting solutions to land degradation are to be found. Sustainable land management (SLM) seeks to avoid or reduce land degradation altogether. There are broad definitions of misuse which can be applied to land. These include wrong use, incorrect or improper use, cruel treatment to land, use of land for a dishonest purpose and harmful use of land. Land misuse presupposes that there is 'proper use' which is either documented by way of planning and zoning or not documented due to lack of planning. It also presupposes that the citizens are aware of what constitutes proper use as well as the reasons and justification for it. Sadly, over the years, the appreciation of this nexus is clearly lacking.

3.4 Land Underuse

Land can also be underused (underutilized) when its potentials cannot be harnessed due to lack of complementary infrastructure or the presence of limiting infrastructure. The absence of access roads, security and utility services such as water supply and electricity in a budding development area, can lead to underuse and this creates overuse (overutilization) in other areas. Land with development potential may suffer due to lack of investment funds or prohibitive interest rates that render development impossible. It may also suffer from community interference with development due to insincerity and multiple sales of the same parcel of land which further drives away investors. Glaring examples of land underuse can be seen in areas where there are pipelines rights-of-way and also where land grabbing is high as Land studies have shown (Kakulu, 2012). Land grabbing stalls development as investors are not willing to invest in areas where customary land titles are constantly in contention.

3.5 Land overuse

Land may become overused by continued fragmentation of the land into smaller plots or by vertical development due to land availability constraints. Several neighbourhoods in Port Harcourt such as Ogbunabali, Diobu, Woji and Elelenwo have become saturated with development. The effect of uncontrolled overuse of land is the development of slums. The quality of life in overused neighbourhoods is poor. Vehicular parking is restricted, crime levels are high, sanitation is poor, electricity supply remains erratic and the system simply cannot cope with the pressure. This has an effect on land and property values. Nexus thinking strategies can inform land management professionals in the public and private sector to take necessary steps to address land overuse.

In the last thirty-four years, I have conducted research and development within the nexus of land and value as presented in subsequent sections of this lecture.

4. STREET CRIME AND PROPERTY VALUES

4.1 Housing, Street Crime and City Regeneration

In a review of the nexus between housing and street crime, Kakulu & Visigah (2016) explore city regeneration options for Port Harcourt, Nigeria. We contribute to the debate that shortage in quality housing supply results in poor quality neighbourhoods and slum-type developments (*land overuse*), which in turn fosters street crime and similar vices. Our study utilized primary data obtained via theoretical sampling, the use of satellite imagery and analytical tools applicable in photographic imagery research methods which included map evaluation and analysis. Observed trends in housing density, reveals that the intense housing pressure is triggered and sustained by in-migration into the City of Port Harcourt, as a

research, to a logical conclusion and thereby make a lasting contribution to knowledge beneficial to the oil and gas sector and oil producing communities.

I explored opportunities for additional research funding and after a near miss for EU funding in 2014, the opportunity came in 2015 when the Tertiary Education Trust Fund TETFund made a call for proposals under the National Research fund. My Team made up of Professor Felix Ikpe (now of blessed memory), a Professor of Soil Fertility and Mrs Akpezi Ogbuigwe, Associate Professor of Environmental Law and Policy, (rtd), secured a N30,000,000 research grant from TETFund to further investigate the governance issues in the valuation of hydrocarbon contaminated farmlands for compensation. The study which commenced in 2017 is currently nearing completion.

In the absence of a distinct regulatory compensation code for use in the Nigerian oil industry, there is the need for intensified and harmonized sectorial effort from different stakeholders, Ministries, Departments and Agencies (MDA's) to ensure that their regulations and activities conform to international best practices in the area of compensation assessment, valuation and payment of compensation. Understandably, this might involve the amendment of existing legislation or enactment of new legislation, regulations or policies for this purpose.

14. CURRENT RESEARCH FOCUS

14.1 TETFund Contaminated Land Valuation Research

In response to the contaminated land issues raised by the UNEP Ogoniland Report submitted to the Federal Government in August 2011, the Shell Petroleum Development Company (SPDC), commenced remediation works on several polluted sites along their RoW's in Ogoniland. As part of an internal quality assurance process, an independent stakeholder review panel was established to perform an independent assessment of the quality of remediation work done by the contractors. As the Rivers State University representative on this panel, I was selected by the team members as the Team lead for this assignment which lasted for over one year, working with other team members from the University of Nigeria, Nsukka and the National Coalition on Gas Flaring and Oil Spills in the Niger Delta (NACGOND). Hundreds of soil samples were sent to international laboratories in the United Kingdom and the Netherlands for assessment. The team made an objective assessment and identified areas of improvement to SPDC.

The outcome of this assignment, particularly the laboratory results indicating the pattern of soil improvement after remediation and possible land recovery, further deepened my interest in hydrocarbon related pollution and the actual value of contaminated farmlands within the context of land as a natural capital. I obtained a green light from SPDC to conduct further research with the data collected and using the equipment provided during the assignment. Armed with the UNEP scientific data and the SPDC remediation data as well as sampling equipment, the missing equation was finance to take these studies and the earlier SDN valuation rates

result of oil and gas as well as other economic activities. This has resulted in uncontrolled housing expansion into the suburbs and poor-quality housing neighbourhoods, which now fosters street crime.

Kakulu and Visigah (2016) recognize that there is a 'chicken and egg' relationship between the phenomena and some confusion as to which one precedes the other. We suggest that a holistic approach is required to deal with street crime which should have planning and city regeneration at its core thus *enhancing the economic value of land* and property. We recommend urban regeneration as a means of curbing street crime and that the primary focus should be to restore a sense of community within neighbourhoods which will happen where there are more owner-occupier residents in an area than otherwise, the justification being that owner-occupiers are less transient than tenants and they help to build stability in neighbourhoods leading to more social organisation. We also recommend a Housing Strategy which can reduce street crime while it deals with the shortfall in housing. Our study calls for concerted effort and corporate synergy towards the production of a long-term Statutory Housing Strategy Policy document at both State and Local Government level, to drive this process.

4.2 Variation in Crime and Property Values

The demand for real property in most urban and sub-urban areas in Nigeria has continued to increase over the years, which has resulted in value increases for properties in those areas. The value of real property depends on the demand for it in relation to its level of scarcity and utility (Olusegun, 2003). A fall in demand as a result of the high wave of crime (*Land misuse*) in a neighborhood will result to a fall in property values. Many types of crime are prevalent in different areas of

Port Harcourt, which affect the demand for, and market value of properties in those areas. In a recent study, Inoma-Abbey & Kakulu (2018), investigate the effect of variation in crime on property values in select neighbourhood's in Port Harcourt. Primary data for the study was obtained from statistics and perceptions on the prevalent crime types in five neighborhoods in Port Harcourt namely; Diobu, Port Harcourt Township, Borokiri, Ogbunabali, and D-Line. The identified crime types include burglary, housebreaking, robbery, kidnapping, and stealing.

The study investigated crime perceptions and consequent actions and discovered that for prospective tenants, the higher the level of perceived crime in a neighborhood, the lesser the willingness of tenants to seek for residential spaces in that neighborhood. However, the perception of residents within these neighborhood's, were a bit different as they perceived crime to be low, and to therefore, to have little effect on the value of properties in the neighborhoods in terms of voids. It was also found that the crimes under study are not considered high enough by the residents in any of the neighborhoods to induce relocation of residents to other neighborhoods.

The findings also reveal that several other factors such as accessibility, neighborhood and environmental characteristics have been identified to positively or negatively influence property values as stated by Ajibola, Ebikefe and Awodiran (2014). There is the need to maintain a low level of crime by tackling crimes headlong in the neighborhoods of Port Harcourt *to ensure a massive improvement in property values.*

Forward Pass						Backward Pass					
DATA PRESENTATION MATRIX FOR FOCUS GROUP INTERVIEW HELD ON THE 9TH OF APRIL 2005 AT THE ATLANTIC HALL, HOTEL PRESIDENTIAL PORT HARCOURT						DATA CLASSIFICATION MATRIX FOR FOCUS GROUP INTERVIEW HELD ON THE 9TH OF APRIL 2005 AT THE ATLANTIC HALL, HOTEL PRESIDENTIAL PORT HARCOURT					
Question	Respondent	Substantive Statements	Category (1)	Category (2)	Category (3)	Main Issues (3)	Themes (2)	Sub-Themes (1)	Substantive Statements	Respondent	Question
FGQ.1	FGR.1	SS1	ST1	SST1	SSST1	SSST1	SST1	ST1	SS1	FGR.1	FGQ.1
FGQ.1	FGR.1	SS1	ST2	SST1	SSST1	SSST1	SST1	ST2	SS1	FGR.1	FGQ.1
FGQ.1	FGR.1	SS2	ST3	SST16	SSST4	SSST4	SST16	ST3	SS2	FGR.1	FGQ.1
FGQ.1	FGR.1	SS2	ST4	SST1	SSST1	SSST1	SST1	ST4	SS2	FGR.1	FGQ.1
FGQ.1	FGR.1	SS3	ST5	SST3	SSST2	SSST2	SST3	ST5	SS3	FGR.1	FGQ.1
FGQ.1	FGR.1	SS3	ST6	SST2	SSST1	SSST1	SST2	ST6	SS3	FGR.1	FGQ.1
FGQ.1	FGR.2	SS4	ST7	SST4	SSST1	SSST1	SST4	ST7	SS4	FGR.2	FGQ.1
FGQ.1	FGR.2	SS5	ST8	SST4	SSST1	SSST1	SST4	ST8	SS5	FGR.2	FGQ.1
FGQ.1	FGR.2	SS6	ST9	SST5	SSST3	SSST3	SST5	ST9	SS6	FGR.2	FGQ.1
FGQ.1	FGR.2	SS6	ST10	SST5	SSST3	SSST3	SST5	ST10	SS6	FGR.2	FGQ.1
FGQ.1	FGR.2	SS6	ST11	SST5	SSST3	SSST3	SST5	ST11	SS6	FGR.2	FGQ.1
FGQ.1	FGR.2	SS7	ST12	SST4	SSST1	SSST1	SST4	ST12	SS7	FGR.2	FGQ.1
FGQ.2	FGR.2	SS8	ST13	SST5	SSST3	SSST3	SST5	ST13	SS8	FGR.2	FGQ.2
FGQ.4	FGR.2	SS9	ST14	SST7	SSST3	SSST3	SST7	ST14	SS9	FGR.2	FGQ.4
FGQ.4	FGR.2	SS9	ST15	SST7	SSST3	SSST3	SST7	ST15	SS9	FGR.2	FGQ.4

Figure 7: Data matrices for the Forward and Backward Pass. Source: Kakulu (2008)

Inductive content analysis is a qualitative method of content **analysis** that researchers use to develop theory and identify themes by studying documents, recordings and other printed and verbal material. An **inductive approach** is concerned with the generation of new **theory** emerging from the data. It is used in cases where there are no previous studies dealing with the phenomenon or when it is fragmented. A **deductive approach** is concerned with “developing a hypothesis (or hypotheses) based on existing **theory**, and then designing a **research** strategy to test the hypothesis. **Deductive content analysis is used** when the structure of **analysis** is operationalized based on previous or emerging knowledge. Phenomenology anticipates iterative data collection and analysis until data saturates and no new themes emerge.

process several times until data saturates. This happens when nothing new emerges from the data.

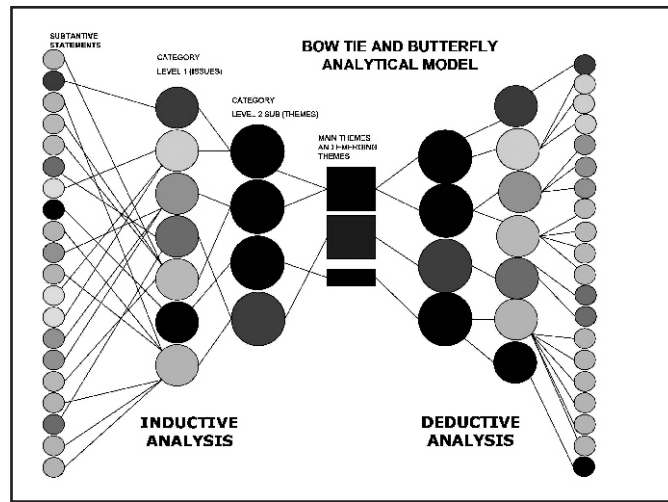


Figure 6: Bowtie-Butterfly Model - Inductive and Deductive Analysis

The BB model systematically organizes text data collected through interviews, focus groups or extracts from documents and letters. Data may be analysed into discrete categories according to their properties and dimensions as they occur within the data itself. By inductive analysis, it produces a rich description about the phenomenon under study as perceived by the participants. This description provides the foundation for data interpretation and analysis of findings. It can also be presented using matrices, graphs or networks - see Fig. 7

5. ENVIRONMENTAL POLLUTION AND RESIDENTIAL PROPERTY VALUES

5.1 Occupant health and Property Use

In a cross-sectional pilot study on petroleum contaminated water and health symptoms in a rural Nigerian community, Kponee, Chiger, Kakulu, Vorhees and Heiger-Bernays (2015) aimed to follow up on the UNEP (2011) report recommendations by investigating health symptoms associated with exposure to contaminated water and assess the adequacy and utilization of the government-supplied emergency drinking water. Recognizing the importance that potential tenants and residents attach to water quality, our study focused on the community of Ogale, located in the Eleme local government area of Ogoniland, where UNEP discovered substantial leakage from an abandoned section of a pipeline carrying refined oil (*Land abuse*). UNEP testing revealed approximately three inches of refined oil floating on the groundwater that supplies the community's drinking water. Few studies have examined adverse effects associated with chronic exposure to elevated concentrations of refined oil products in the general population. Trained interviewers administered standardized questionnaires in each respondent's home which were developed for this pilot study. They included primarily closed-ended questions regarding demographics, smoking habits, water supply, water safety, current health symptoms and medical history. Participants were asked to report their primary water source and duration of its use for specific household activities: bathing, cooking, washing, drinking, brushing teeth, cleaning the house, and washing clothes, dishes and food. We collected information on primary source water characteristics such as odour and perceived safety. We asked individuals in Ogale who reported receiving emergency government-supplied water about the

duration, frequency and sufficiency of water delivery. We observed statistically significant associations between exposure to petroleum-contaminated drinking water and self-reported symptoms consistent with exposure to petroleum hydrocarbons. This can lead to stigmatization of the neighbourhood which will have *a negative impact on the future of land values* and property investment within the Local Government area. This important nexus should not be ignored.

5.2 Indoor Air Quality and Residential Property Use

In another study on elevated indoor volatile organic compound exposure in the Niger Delta Region of Nigeria, Kponee, Nwanaji-Enwerem, Fu, Kakulu, Weisskopf, and Jia (2018) address another one of the recommendations of the UNEP Ogoniland Report (UNEP, 2011), which is the monitoring of volatile organic compounds (VOCs) across different media (water, soil, and air) in Ogoniland. In this pilot study, we measured indoor VOC concentrations in the indoor air of 20 households in Ogale, an Ogoniland community whose groundwater system is contaminated (*land abuse*) with benzene at levels 900 times the World Health Organization guidelines (UNEP, 2011).

We evaluated self-reported health conditions and predicted cancer risks and hazards from inhalation exposure to VOCs. We detected higher concentrations of benzene (mean = 25.7 $\mu\text{g}/\text{m}^3$, SD = 23.2 $\mu\text{g}/\text{m}^3$) and naphthalene (mean = 7.6 $\mu\text{g}/\text{m}^3$, SD = 13.8 $\mu\text{g}/\text{m}^3$) than has been reported in other regions. These results exceed common risk benchmarks in the United States, suggesting a need for further studies to characterize VOC exposures, sources, and associated health risks in the Niger Delta (Kponee et al, 2018). Clearly, there are long-term consequences of stigmatization of residential neighbour-

obtained. They are represented in the matrix in Fig. 7 as SS and numbered. Through a process of data reduction, thematic groupings emerge and are depicted by two sets of larger circles. This inductive process continues moving towards the original research questions depicted by the squares.

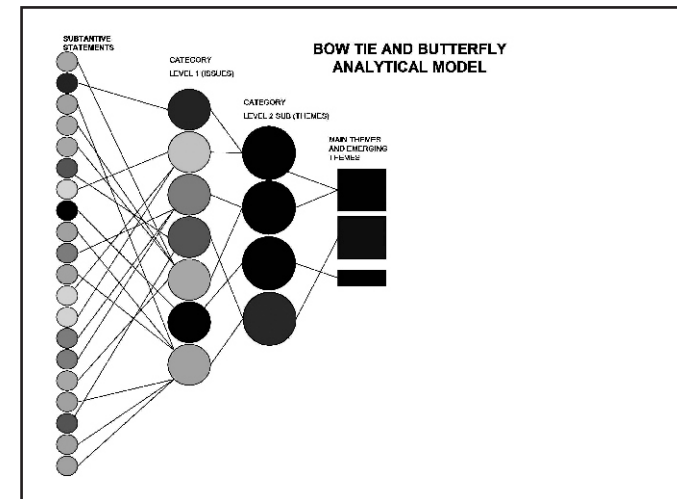


Figure 5: Bowtie-Butterfly Analytical Model - Induction

The mirror image to the right consists of properly sorted data and theory building that is grounded in the data collected. Because of robust nature of phenomenology in capturing participants views, new ideas might emerge that are worth further investigation that are outside of the original study but relevant. Such new ideas or concepts are appended at the bottom of the bowtie notch with rectangles. The more rectangles that are appended below the square, the more like a butterfly the image becomes indicating further investigation of future research. A rigorous researcher will repeat the BB

procedures, an original analytical model was developed (**Kakulu**,2008) which is an invaluable tool for analyzing qualitative research data particularly from focus group and interview transcripts.

The model known as the Bow-Tie-Butterfly (BB) model gets its name from its graphical appearance. The model was developed (**Kakulu**, 2008) to deal with the complexities of focus group interview data analysis in phenomenological research. Available manual and automated tools are very efficient for use in the analysis of qualitative data from interviews. However, for use in qualitative research with a philosophical orientation in phenomenology, an added complication was introduced. The phenomenological philosophy requires that the integrity of the data is preserved and that each contribution has equal chances of being considered in the analysis, for this reason, methods which require pre-assigning of categories for analysis were considered to be less suitable.

In developing the BB method, the traditional analytical patterns of phenomenology and focus groups were fused by making a slight modification to the principles put forward by Moustakas (1994) and Krueger (1994, p.127). The development of this tool commenced in 2005 and was concluded in 2007. Using infographics to illustrate the workings of the tool, two shapes emerged resembling a bowtie and a butterfly. On completion of the model building, I christened it the Bowtie-Butterfly analytical technique BB Model - see Figs. 5-7. In the illustrations in Fig. 5 and Fig.6, the individual comments, suggestions, contributions known as substantive statements are depicted by little circles in the chronology in which they were made or

hoods and where clear action is not taken to put a complete halt to land abuse through oil spills from all sources, the next few decades may witness declining land values as places become less habitable or perceived to be so.

6. GOVERNANCE AND LAND USE

6.1 Weak Governance and Land Values

In a study on participatory rapid co-design for transformative resource governance research in the Gulf of Guinea (Chigbu, Masum, Vries, Siegert, Mekuria, Sakaria, Agboeze, Assoua, Ntiador, Mulenga, Amelia, **Kakulu**, Faria, Adjue and Kaghoma, 2016), we identify weak governance institutions as one of the leading causes of resource challenge in the Gulf of Guinea and call for a transformative approach. Data, obtained from case studies from four Gulf of Guinea countries, Angola, Cote de Voire, Democratic Republic of Congo and Nigeria, was used to present a framework for creating transformative change through resource governance. We discussed a participatory and rapid co-design approach which was used to explore pathways for achieving transformative resource governance and conclude that transformative resource governance is a process, rather than an end, and that it emerges from productive engagement between governments and local communities.

In Nigeria, we discover that increasing *land resource conflicts* is militating against fair compensation to communities affected by oil spills. By conducting a comparative situational analysis of the local and national land governance systems, we conclude that peace is a precondition to transformative resource governance.

6.2 Ancestral Land Boundaries and Land Use Conflicts

Chigbu & Kakulu (2018) explore how a mapping of ancestral land boundaries for conflict prevention in select Niger Delta communities, can lead to transformative social change. We propose a conceptual framework for transforming oil-rich communities of Ogoniland (Nigeria) through the mapping of ancestral land boundaries for conflict prevention. Geodetic mapping of ancestral land boundaries and social mapping of land rights borders will lead to defined community land and natural resource records. It will serve as documentary evidence for communities when negotiating with the government and multi-national corporations. Our study contributes to general ways for transformation in the area of boundary delineation through the application of geographical information systems tools and documentation of traditional land boundaries. We propose transformation in the area of boundary delineation and documentation of traditional land boundaries in Nigeria with special focus on oil producing communities. Such mapping should however not necessarily be connected to oil production activities but should form part of a local cadaster map which could be used to facilitate compensation during land acquisition, payment of royalties, local content employment or compensation in case of oil spills.

6.3 Traditional Land Delineation and Property Value

In a study on the challenges of the traditional land delineation practices, Allison & Kakulu (2018) identify the challenges posed by the traditional land delineation practices on property investment, and on the development of the property market in Bonny, Nigeria (*Land underuse*). The traditional land delineation practices involve the use of natural features such as rivers, streams, live trees, which are still in use as at 2018.

their field of perception in order to see life as these individuals see it.

There is not one phenomenological methodology but rather a variety of methods that all hold to the primacy of the subjective experience. Phenomenological analysis requires the researcher to state his or her assumptions regarding the phenomenon under investigation and then bracket or suspend these preconceptions in order to fully understand the experience of the subject and not impose any a priori hypothesis on the experience. A phenomenological study may be challenging to use because the researcher requires a solid grounding in the philosophical precepts of phenomenology; the participants in the study need to be carefully chosen to be individuals who have experienced the phenomenon. Bracketing personal experiences by the researcher may be difficult, the researcher needs to decide how and in what way his or her personal experiences will be introduced into the study (Creswell 2003).

13.4.2 The Bowtie-Butterfly (BB) Model Development

In **Kakulu** (2014), I describe qualitative research strategies for undertaking real estate research with underlying philosophical undertones rooted in phenomenology. Phenomenology is a common philosophical orientation of researchers in the field of medicine and diagnostic research. I considered that real life problems are better approached by investigating the root cause and giving all identifiable stakeholders, an opportunity to contribute to and inform the research project. Using an amalgam of principles of computer assisted qualitative data analysis software (CAQDAS) such as ATLAS.ti, NVivo; and qualitative data analysis

13.4.1 Phenomenological Research

I decided at an early stage in my research career to align with great thinkers in the phenomenology (Moustakas, 1994). Phenomenology, which literally means the study of phenomena is both a philosophy and a research strategy. It is a way of describing something that exists as part of the world in which we live such as events, situations, experiences or concepts. We are surrounded by many phenomena which we are aware of but may not fully understand and our lack of understanding of these phenomena may exist because the phenomenon has not been overtly described and explained or our understanding of the impact it makes, may be unclear. The central focus in phenomenology is exploring how people make sense of their experiences individually and as a shared meaning which requires rigour and detail to achieve. According to Patton (2002:104), the term phenomenology has become so popular and has been so widely embraced that its meaning has become confused and diluted. It can refer to a philosophy; an inquiry paradigm; an interpretive theory (Denzin and Lincoln 2000:14); a social science analytical perspective or orientation; a major qualitative tradition (Creswell 1998) or a research method (Moustakas, 1994). Phenomenological research begins with the acknowledgement that there is a gap in our understanding and that clarification or illumination will be of benefit. According to Hannock (1998), phenomenological research will not necessarily provide definitive explanations, but it does raise awareness and increases insight. Creswell (1998) cites (Bruyn, 1966) who states that phenomenology serves as the rationale behind efforts to understand individuals by entering into

Using an exploratory research design, surveys were conducted, and structured questionnaires administered to the Kings, Chiefs, Elders and opinion leaders with a 66.5% response rate.

Land use planning processes and land rights formalization increases the land tenure security and ultimately enhances land values (*Highest and best use*). Contradicting land policies and over-lapping property arrangements are found to have diverse interpretations by different actors in many countries (Fairley, 2012). It means that land managers require better knowledge on how competing interests and actors interact with what determines the practical competitive outcomes as demand for land intensifies involving local and international actors regulating natural resources.

Real estate consists of one or several land parcels which can be used for investment purposes and as such need to be properly delineated. The study assessed participants perceptions of the effects and challenges of traditional land delineation practices on their land value. The findings reveal that traditional land delineation practices undermine land effectiveness and sustainability. It also introduces constraints in access to credit facilities leading to *land underuse*; insecure title lowers land values and increases household's engagement in costly land protection efforts; decreasing land-related investments; decreasing land market participation amongst others.

The challenges of the traditional land delineation practices include fewer opportunities for development; absence of land; communication; variation in real estate pricing; insecurity in land tenure and rights; lack of efficiency in the land sector. The nexus in this context is a system for recording land ownership, land values, land use and other data on land. This is required as a tool to improve real estate investment in a

sustainable manner, in line with the industrializing nature of Bonny. The study concludes that traditional land delineation practices can be enhanced with the introduction of modern GIS methods of land delineation to provide incentives and deal with these challenges to achieve a truly competitive property market and improve real estate investment opportunities and *enhance land values* in Bonny.

7. PROPERTY CONSTRUCTION, MAINTENANCE AND VALUE NEXUS

7.1 Building Maintenance Management

Buildings are a form of landed property consuming huge capital investments and therefore require to be properly maintained for value retention purposes (*Highest and best use*). The concept and practice of building maintenance management seeks to debunk the myth that maintenance is a bottomless pit for scarce financial and resources. It replaces this myth with the concept of careful planning and budgeting for maintenance while ensuring the development of a sound building maintenance culture.

My early academic career focused on establishing the nexus between micro climatic variations and building design in equatorial regions; I investigated the nexus between poor choice of design in relation to climate type and the stress this poses to buildings and ultimately building maintenance management. The nexus between maintenance and property value was the thrust of early career research, presentation at conferences, workshops. I have taught the course Building Maintenance and Building Maintenance Management for over 30 years to undergraduates in the departments of Estate Management, Architecture and Quantity Surveying, supervised several undergraduate and postgraduate projects

outcome of this workshop was a commitment by Deans and Heads of Departments to 'greening' of their course contents.

13.3 MSc. Estate Management - Land Management and Sustainable Development Option

In further response to the university workshop, the Department of Estate Management, in the development of the Postgraduate programme in Estate Management, included an option on Land Management and Sustainable Development. This option enables MSc and PhD students to focus on the nexus between the environment and property development, as well as sustainable development issues connected with access to land, development finance, gender issues and pro-poor issues. Since the programme commenced in 2014, we have produced several graduates. Other activities on sustainable development include other co-authored publications (Ihuah and Kakulu, 2013; Ihuah and Kakulu, 2014; Ihuah, Kakulu and Eaton, 2015).

13.4 Qualitative Research Methods in Real Estate

Kakulu (2014) asserts that all research is conducted within paradigms, which represent a researcher's particular way of thinking about a subject matter and which the individual researcher shares with other like minds. I have made some novel contributions to research and development methodologies and preferred approach in the field of real estate research and development.

13.2 Mainstreaming Environment and Sustainability in Higher Education

In 2007, I was invited by the Head, Environmental Education and Training, United Nations Environmental Programme, Nairobi - Kenya in the person of Mrs Akpezi Ogbuigwe, to participate in a Sustainable Communities training programme in Helsinki, Finland. The outcome of this training led to an invitation to several other training programmes held in Sweden, Ghana, Nairobi, Cameroon, Canada and Nigeria. In November 2008, I was invited to participate in an award-winning high-level policy debate on the concept of 'sustainable development in Africa'. My Team made up of participants from 4 countries, took time to de-construct the Construct called 'Sustainable Development' and emerged winner. Participants from the winning team were sponsored to attend the World Environmental Education Congress (WEEC) in Quebec, Canada in June 2009. This opened a new area of research interest in Education for Sustainable development with special focus on Sustainable Land Management and sustainable development.

The Vice Chancellor at that time, Professor B.B. Fakae, was one of five Vice Chancellors invited by Mrs Akpezi Ogbuigwe to make a presentation at the First Mainstreaming Environment and Sustainable Development into Higher Education Workshop in Nairobi. The outcome of this interaction led to a commitment by RSU to organize an institutional workshop on mainstream environment, climate change and sustainability through greening of the syllabus across all Faculties, (Kakulu & Fakae, 2009). In 2009, the Rivers State University organized the first ever University-wide workshop on Mainstreaming Climate Change, Environment and Sustainability into Higher Education. The

and published severally on this subject - see Kakulu (1990); Kakulu (1995); Kakulu (1996); Kakulu (2001); Barango & Kakulu (2012); Mac-Barango & Kakulu (2014); Ihuah and Kakulu (2014); Ihuah, & Kakulu, I. I. (2016). Ihuah, Kakulu & Eaton (2016). In 2006, I chaired a University Senate Committee that produced a draft Building Maintenance Policy for the Rivers State University which sadly, is yet to be implemented.

7.2 Construction Patterns and Property Value

Abam and **Kakulu** (2015) assess ground conditions for flood-Proof basement construction in Abuja, Nigeria and the potential risks to water influx problems and the related structural stability which can impact on property investment values. Construction activities in Abuja became intense following the Federal government's directive for all Agencies of government to establish offices in the capital city. Due to the high premium on land in the Federal capital Territory, Abuja caused by the high pressure of demand for accommodation, many developers explored the use of underground space for the construction of basements without regard to the hydrological and geotechnical challenges. Although geological and geotechnical data of the underlying soils are needed for the design of suitable foundations for the structures, we consider that they are not enough when construction of basement units are involved. The study discovered that basement construction is not only a challenge to property investors but of concern to owners of adjoining properties with regards to the protection of their own properties from damage caused by adjacent basement construction. In addition, the disruptive effect of the construction process when a basement is built, the potential for basements to cause changes to the ground water regime in

an area and consequential flooding, and the long-term change to the character of the area are also important considerations, which are hardly addressed. Longer-term observation of water level fluctuation provides the basis for understanding the potential risks to water influx problems and the related structural stability issues that can arise. The study describes an integrated geological, geophysical and geotechnical investigation carried out to fully characterize the sub-soils and groundwater conditions for foundation stability as well as the prevention of groundwater influx into basements units of foundations within Abuja municipality. It shows the Nexus between construction and land value.

7.3 Wetland Construction and Property Value

The development of buildings on floodplains, wetlands and areas below sea level increases the risk of *climate change induced hazard on property values* and in some cases may lead to disaster beyond the coping capacity of the vulnerable and the exposed. According to Wechie (2017), there is need to use land management policies as a proactive tool for climate change mitigation. In supervising this MSc Dissertation, we investigated the continued development of highbrow properties on floodplains and areas below the sea level along Abacha Road and Odili road in Port Harcourt, Rivers State (*land overuse*). We reviewed the risks associated with such huge financial investments particularly the threat of flooding and the potential diminution in value occasioned by the stigma associated with neighborhoods known for flooding. The study recommends the use of economic instruments to reduce incidences of continued development in flood prone areas as well as land management tools in the form of specific codes designed specifically for wetland developments.

at Ofoma Associates, a reputable firm of Estate Surveyors and Valuers in Port Harcourt. My passion for ICT in real Estate resulted in several conference presentations and publications (**Kakulu**, 2003; **Kakulu**, 2008, **Kakulu**, Okorji and Ogbonda, 2009).

13.1.1 Teaching of Computer Applications to Real Estate in Nigerian Universities and Polytechnics

Between 2002 and 2005, as a member of the Estate Surveyors and Valuers Registration Board of Nigeria (ESVARBON), I played a key role in mainstreaming ICT in Real Estate as a compulsory course for Estate Surveying and valuation students in Nigerian Universities and polytechnics. For several years, the main reading text for this subject was my Text book on Computer Applications to Real Estate Practice in Nigeria.

13.1.2 Computer Appreciation Training for Estate Surveyors and Valuers.

In 2012, I was appointed as the Honorary Managing Director of the Nigerian Institution of Estate Surveyors and Valuers Learning Centre (NLC) a position I held for three and a half years. During this period, I developed and organized a series of train-the-trainer workshops for Estate Surveyors on ICT in Real Estate. In my determination to take ICT training for surveyors to the length and breadth of this country, I organized Training workshops and facilitated all of them at Covenant University Ota, University of Benin, Abubakar Tafawa Balewa University, Bauchi, Federal University of Technology, Minna and at the Rivers State University. Training was also organized for Estate Surveyors in the Federal lands sector.

- 3 Will replacement farms if provided be within the same radius - usually 2km to 3km from their current residence and accessible on foot or bicycles, or will they need to travel further away by Motorcycles or Cars?
- 4 Will affected farmers get alternative land for free, or will they be made to hire land for subsequent farming seasons at a cost?
- 5 Will the compensation cover the total loss from spill to full restoration of the land until it is fit for agricultural production, and, who would be responsible for the period of waiting?

In my philosophical approach to research which is phenomenology and grounded theory, perceptions are an important element in land abuse and compensation and should not be trivialised.

13. OTHER CONTRIBUTIONS TO RESEARCH AND DEVELOPMENT

13.1 ICT in Real Estate Practice in Nigeria

In 1986 while undertaking postgraduate study for the award of a master's degree in Urban Land Appraisal at the University of Reading in the United Kingdom, Information and communications technology (ICT) in real Estate was a budding field of learning and for which I developed a strong passion. On return to Nigeria, I commenced the development of simple IT based solutions for real estate projects with the support of Kalverwood Systems, an indigenous software development company. The simple routines were used to automate data processing particularly in compensation assessment and computation of claims (Kakulu, 2003). The software proved to be very useful during the NLNG Right-of-Way Acquisition project in 1996-1997 where it was deployed

Kakulu & Brisibe (2014), suggest the need for proactive research into climate change, property design and management; mainstreaming environment and climate change into surveying and construction education; as well as continuous professional development training on environment and climate change implication. With the adverse effects of climate change such as intense rainfall, storms and flooding on the increase, buildings will have to adapt to cope with future impacts of climate change. We examined buildings in Yenagoa, Bayelsa State that were affected during the 2012 flood disaster using damage assessment survey methods to determine the nature and level of damage the buildings incurred and the future maintenance implications. Our findings revealed various levels of damage based on varying degrees of water retention in the buildings as well as a change in building deterioration patterns in Yenagoa. We recommend that architects and property managers alike should be more proactive in design and property management research to enhance flood resilience in buildings. We also suggest the adaptation of existing techniques and the experimentation of innovative flood resilience methods for possible best practice in Yenagoa.

8. EXPROPRIATION OF LAND AND VALUATION FOR COMPENSATION

8.1 Compensation and Property Value

The period from 2003 to 2008 was spent undertaking studies for the award of a PhD at the Henley Business school, University of Reading, United Kingdom. My PhD thesis reviewed the processes and methods in valuation for compensation in compulsory land acquisition for oil and gas production processes. The outcome of this thesis resulted in several publications including a book of readings, see

(Kakulu, 2008; Kakulu 2008a; Viitanen and Kakulu, 2008; Kakulu, Viitanen and Byrne, 2009; Kakulu, 2009 and Kakulu, 2018).

Compulsory acquisition or purchase is the process by which local and national governments obtain land and premises for development purposes when they consider this to be in the best interest of the community. According to Viitanen & Kakulu (2008), the process of valuation for compulsory acquisition of landed property is governed by legislative statutes that vary from one country to another. The term has a number of variants some of which are compulsory purchase; expropriation; land-take or eminent domain. In all cases the owners or occupiers are denied their property rights for overriding public interest, public purpose or public benefit and are entitled to full, just, fair, equitable and adequate compensation. Compulsory purchase is an important tool in land acquisition although in many countries land acquisition can often be arranged through other means such as by voluntary agreements. In Rivers State however, the use of voluntary agreements continues to be abused by communities who return to the land decades later to make claims for compensation reneging on the decisions of their ancestors which brought development to the land - *land rights abuse*.

In recent years discussion on the use of compulsory purchase had been rather limited and new legislation, practices and methods of valuation for compensations may have developed and been adopted over the years in several countries. Valuation for compensation may also be required where land is physically taken, or a portion of the total land is taken under the laws of eminent domain such as compulsory purchase or acquisition. Whatever the case, the basic principles of what compensation seeks to achieve should be reflected in the final outcome of the valuation. It is expected that there must be the

Management; Urban and Regional Planning and Surveying and Geomatics. The LAT received cooperation from Academics in the departments of Estate Management and Geo-informatics at the Ken Saro Wiwa Polytechnic (KENPOLY) in Bori. This innovative strategy was subjected to several iterative processes and continuous refinement throughout the implementation with review of daily feedback from the UNEP technical teams in the field. The land access tool however achieved reasonable success in meeting its set objectives. It can be used or adapted for use in similar development and environmental assessment projects (Kakulu et al., 2014). The success of the land access initiative was made possible because of the robust technical collaboration project between the Rivers State University and UNEP which I was instrumental to and for which I served as the Project Collaboration Coordinator (PCC) from 2010 to 2011.

12.4 Farmers Perception of Reasonable Compensation

Kakulu and Nuhu (2012), highlight the perception of farmers in issues of oil pollution and compensation. Our study discovers that farmers prefer to simply have their farms functioning and producing crops, over and above any form of monetary compensation. The key research questions emanating from a study involving over 700 farmers in Ogoniland in relation to compensation, are as follows:

- 1 Would the farmers be forced to seek alternative sources of food supply to replace the farm products they can no longer cultivate after they have received monetary compensation for one years' worth of damage?
- 2 Would the farmers need to relocate their farms due to the presence of contamination after one year or are they able to move back into the land at the expiration of the compensation payment?

entry and land access strategy developed jointly by Prof. Kakulu and the UNEP project management team.

12.3 Land Access Strategy and the UNEP Ogoniland Project

Land access remains a contentious issue and can have serious consequences for polluter as well as the affected lands or community. There is a connection between prompt access for clean-up and protracted delays which further aggravates the consequences of the spill. For a period of approximately 14 months, the UNEP team along with her technical partners at the Rivers State University, traversed the length and breadth of Ogoniland using four-step land access protocol designed by the project team. Kakulu, Igbara, Akuru & Visigah (2013) describe the land access challenges encountered during the UNEP project and benefits of the community entry protocol. On the issue of land access, the UNEP report acknowledges that, *'facilitating access to specific sites where UNEP specialists needed to collect data was a major exercise and one that needed to be handled delicately as ownership was not always clear with attendant potential for local conflict. Multiple negotiations were often required, involving traditional rulers, local youth organizations and individual land owners or occupiers. A Land Access Team, provided by RSUST, working in conjunction with UNEP's Communications Team, managed these challenging issues, explaining precisely what the UNEP team would be undertaking, where and at what time.'* (UNEP, 2011, p. 57).

The Rivers State University (RSU) implemented the Land Access strategy using a Land Access Team (LAT) coordinated by Prof. Kakulu. The team was made up of academics and student interns drawn from the departments of Estate

aim behind a claim and to further qualify this aim, some of the fundamental principles of compensation are discussed.

8.2 Principles of Compensation

Legal presumptions in favour of compensation consider the principle of equivalence where the affected land owner is entitled to be compensated fairly and fully for his loss. The owner has the right to be put, so far as money can do it, in the same position as if his land had not been taken from him or had not been damaged. In other words, he gains the right to receive a money payment not less than the loss imposed on him for overriding public interest or damage caused by a culpable party. Secondly, adequacy and fairness are crucial otherwise *property value becomes compromised*. It is essential that the quantum of compensation assessed and actually paid, is adequate and sufficient to replace the full extent of the loss sustained and the assessed value should be achieved without cheating or trying to achieve unjust advantage over the land owner. Justice and equity are vital requirement of compensation and should be assessed in such a manner that it ensures that justice has been granted to the affected party and equity is also achieved. In the absence of timeliness and reasonableness, requirements for compensation might not be fully satisfied. Payments should be timely, and reasonableness is required at all stages from both parties. Exorbitant and unjustifiable claims should not be encouraged as well as unreasonable claims put forward by the claimants, see (Kakulu, 2008; Kakulu, 2009; Kakulu, Viitanen and Byrne, 2009).

9. RIGHTS-OF-WAY AND DEVELOPMENT LAND VALUE

9.1 Pipelines and Property Development in Greater Port Harcourt

Kakulu (2012) examines the pattern of development in and around of communities traversed by Wayleaves also referred to as Pipelines Rights-of-Way (RoW). The studied area, Rivers State, is situated on the coastal plains of the eastern Niger Delta in the heart of the oil producing region. It is home to several concessions and oil mining license operators whose activities have left notable landmarks consisting of a maze of several kilometers of transportation and transmission pipelines. This constitutes a challenge for urban planning and real estate development activities in the region. In this study, I recognize that urban development and re-development processes occur within a complex scenario of locational or economic advantages and constraints which together combine to shape the overall pattern of the physical development and ultimately land value patterns. In oil and gas producing areas, production activities are enabled by pipeline infrastructure traversing several kilometers and crisscrossing several communities and towns along its path, from product source through to processing, consumption outlets or export terminals. The oil and gas industry enjoy wayleaves under various enactments that enable them to restrict third party access or crossing over the pipelines RoW.

9.2 Pipelines and Urban Development

From an urban development perspective, there are potential planning and development challenges arising from pipeline wayleaves which should be taken into consideration in urban design or upgrade. The launch of the 50-year Greater Port Harcourt City development master plan in 2008, presented an opportunity to review historic development patterns that had

ample opportunity for knowledge exchange between the partners - the Rivers State University and UNEP.

Working with a large team of counterparts, the international experts could focus on bringing their skills and expertise to the table without being distracted by issues which were possibly better handled by the national experts. From an academic perspective, Kakulu et. al., (2014) confirms that the collaboration and the involvement of several persons from within the Rivers State University opened new frontiers of research and opportunity for academic publications. Collaboration calls for a merging of ideas and a great deal of flexibility is required. The UNEP study depicts a classical example of the dividends of collaborative projects.

12.2 Land Access in the UNEP Ogoniland Study

Environmental surveys that require access to communal, family and individual farmlands, mangrove swamps or fishing villages to obtain data, can be very challenging to any team of environmental professionals working locally or on international development related projects. Land access restrictions may be imposed by different interest groups or stakeholders whose actions could interfere with the overall conduct or success of any environmental survey irrespective of its laudable goals and objectives. It might also be that the traditional land tenure patterns may differ significantly from land tenure patterns as they are understood by a multicultural project management team. In response to a Federal Government invitation in 2006, the United Nations Environment Programme (UNEP) undertook a comprehensive environmental survey of several communities in Ogoniland in the Niger Delta region following reported and documented high levels of hydro-carbon pollution in these areas. The project relied heavily on an innovative and culture-driven community

12. COLLABORATION IN DAMAGE ASSESSMENT SURVEYS

12.1 Technical Collaboration Benefits

In **Kakulu**, Fakae and Cowing (2014), we describe the challenges associated with conducting Environmental Assessment Surveys using a multi-national and multi-cultural expert team and how these challenges were overcome during the UNEP led environmental assessment of Ogoniland project in 2009.

Environmental assessment projects can range from very simple local projects involving the investigation of a single site to large and more complex international projects involving multiple locations; investigating multiple environmental media; and executed by a multi-cultural project management team. In the case of a post impact assessment survey, the goal is to gain access to impacted sites; collect relevant data; analyse the data and produce a report. In real life situations however, such a simple description does not match the complexity of the process as observed in actual field operations. The socioeconomic and socio-cultural environment in which a project takes place presents its own challenges to a project management team. An understanding of the expectations of local community is a key success indicator. In the absence of working knowledge and understanding of local expectations, complex international projects may depend on joint working relationships between independent bodies in the form of collaborative partnerships to achieve their set goals. Using this approach, the planning and implementation of the project's activities becomes joint responsibility of the partners and which may lead to the creation of new organizational structures and new implementation processes. the Ogoniland Project provided

been shaped by pipelines wayleaves alongside the potential challenges this will have on the implementation of the new master plan. **Kakulu** (2012) revealed that peri-urban lands severed by pipeline wayleaves exhibit a development pattern similar in shape to a spider's web with isolated pockets of triangular shaped land bounded on all sides by pipelines. To tackle this land use challenge, I recommended the creative adaptation of this 'Spider's Web' phenomenon as a development model that can manage the land use requirements of the Master Plan, in harmony with existing land use pattern and thereby *unlock land value potentials*. Port Harcourt which is the capital city of Rivers States grapples continuously with sporadic and uncontrolled expansion which has led to saturation in its immediate suburbs. It is currently sprawling beyond the suburbs into rural farmlands and peri urban communities where most of these pipeline networks traverse.

The infographic in Fig. 1 portrays the configuration of pipelines consisting of pipes running from oil wells and converging at plants and flow stations. It also shows pipelines running out of these plants to export terminals or to local industries.

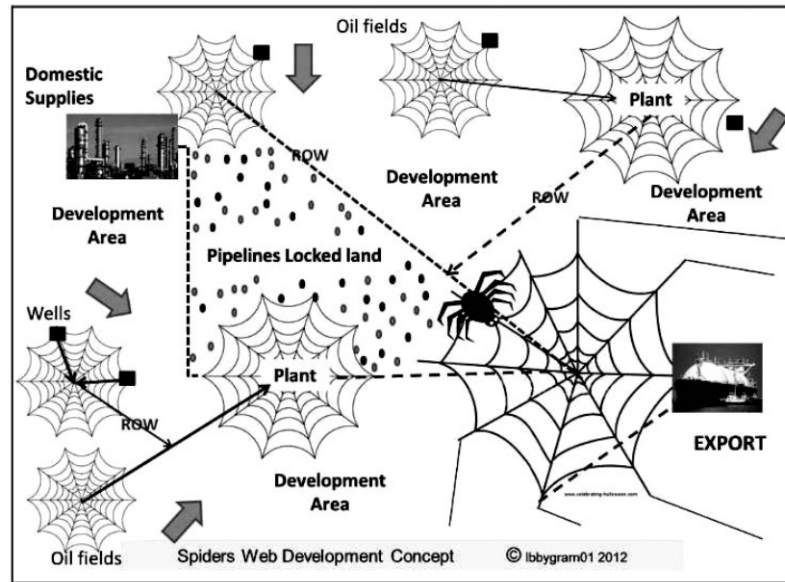


Figure 1- Model of the Spider's Web Development Pattern. Source: Kakulu (2012:766)

Rivers State is also home to several consumers of liquefied Petroleum Gas (LPGs) and Natural Gas Liquids (NGLs) represented by the petrochemicals and fertilizer industries. Gas transmission pipelines travel very long distances from source to industry. Communities along the direct path of these product transportation pipelines experience land severance issues of a magnitude that is currently under-researched but is believed to contribute to restiveness in the region.

9.3 Pipelines Locked Land

Considering that pipelines are sub-surface, they act as invisible boundaries which are capable of separating siblings, families and communities leaving them fragmented and, in some cases, unable to develop as a single functional unit. **Kakulu** (2012) also examined the implications of the presence of pipelines wayleaves and the potential impact on



Figure 4 - Untreated Sewage Discharge and Ogujagu - October 2008 Source: Kakulu (2009:

I initiated further research into the menace of abattoirs and the nexus with surrounding property values. Izebe (2017) examines the Land Use implications of the location of Abattoirs in residential neighbourhoods in Port Harcourt. In supervising this dissertation, we concentrated on the policy issues surrounding decision-making on the choice of a site for abattoirs. In focus group meetings with abattoir operators and interviews with relevant government agencies, the study discovered that there is no EIA associated with establishing an abattoir. The marine environment is not protected from abattoir untreated waste. Residents complain about air pollution which ultimately influences the rents they are willing to pay. The nexus between the presence of abattoirs and value was clearly established in this study.

pollution from untreated wastewater. Between September 2008 and July 2009, UNEP/GPA in a collaborative partnership with the Rivers State University, Port Harcourt, Nigeria, successfully organized 10 deliveries of the Train Sea Coast Course to address issues of wastewater management in coastal cities. Nine of these courses were held in Nigeria and a tenth course in Buea, Cameroon. I was instrumental to the delivery of 10 capacity building workshops on 'Improving Municipal Wastewater management in African, Caribbean and Pacific (ACP) countries. The capacity building workshops held in Rivers, Akwa Ibom, Cross Rivers, Bayelsa, Delta, Ondo, Lagos State, Abuja and in Buea, Cameroon. The Vice Chancellor, Professor B.B. Fakae was present to flag off the training programmes in Uyo and Abuja.

The training received the attention, full support and backing of the Rivers State Government who took immediate action on the menace of the illegal discharge of untreated sewage into the creeks at Ogujagu. The Image in Fig. 4 was taken during a visit to the community controlled illegal sewage discharge point in October 2008.

The training field visits also highlighted the menace of untreated abattoir waste at the Trans-Amadi abattoir and its effect on surrounding surface water. It drew the attention of the Ministry of Environment to the burning of cow hides with used tyres. Action was taken immediately after the site visit and in 2008 the use of tyres to burn cow hides was stopped.

future development of the Greater Port Harcourt City and ultimately on land value patterns. An interesting finding is that the Oil Pipelines Act s.16 (1) already provides for the provision of level crossings over pipelines to reduce the sufferings caused by severance. This provision has to be revisited and the modalities for its implementation developed to *reduce land underuse* in Rivers State.

In **Kakulu** (2007) and **Kakulu** (2012), I discussed the concept of 'pipelines locked lands' and suggested the need for a re-evaluation of the interference of existing pipeline wayleaves with land use and land values. There is the need to unlock these locked parcels of land by the provision of improved accessibility which will *release land value potentials*. While leap-frogging provides an explanation for the visible development pattern (Owei, Ede, Obinna, and Akarolo, 2008); property market forces of demand and supply work differently. Land values in the Igbo Etche neighbourhood appear unresponsive to demand and supply forces unlike neighbouring peri-urban areas like Rukpokwu and Obigbo. The forces of demand and supply appear to have become distorted with land values being considerably higher in more remote peri-urban areas.

9.4 The Spider's web as an Intervention Model

Sustainable development of pipelines-locked lands in Igbo Etche and similar locations will depend on the availability of definitive pipeline maps showing an authoritative record of wayleaves. The map in Fig. 2 below shows pipelines crossing the Port Harcourt - Igbo Etche road and reveals triangular shaped parcels of pipelines locked lands.

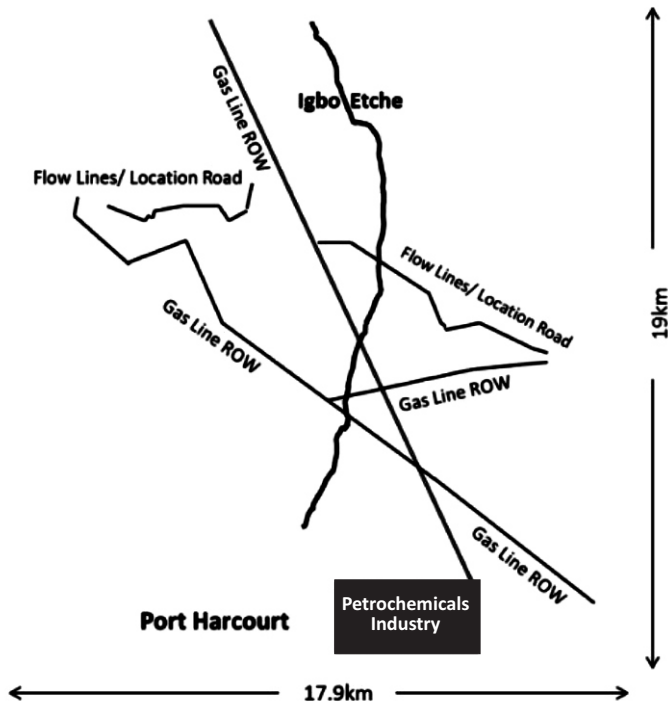


Figure 2 - Proposed New Road(s) made up of Radians and spirals (Source: Kakulu, 2012:767)

For a coordinated approach to development particularly at the local government level, local government authorities need to have an inventory of wayleaves traversing their administrative jurisdiction and boundaries as this will foster meaningful development plans and also enhance their development approval processes. The responsibility for producing such a map should be threefold involving the holder or holders of the statutory right of occupancy/licensee, the LGA and the direct community over which such wayleaves exists. Intervention Model Concept The concept behind the intervention model is based on the premise that the existing development patterns have grown around the pipeline

stretches of farmlands required for subsistence and other economic gains as a result (Kakulu, 2014).

The focus of the Valuation professional is in determining the **loss in value of land** for its highest and best use within a given physical location. Typically, in most rural lands, the highest and best use is usually agricultural. Determining or forecasting a future annual income stream is a major component of property valuation that can be based on knowledge of actual income; historical income data and trends or historical/projected inflation and income growth profile including data from comparable investments. As part of the TETFund sponsored study, the research team is working on forecasting farm incomes.

Internationally, there is not one method for valuing contaminated land but a plethora of suggested methods from which a Valuer may choose based on the peculiar circumstances surrounding each case. In Nigeria the Valuer is not given the professional flexibility to utilise the most appropriate method owing to the interplay of overlapping and conflicting legislation which needs to be meticulously studied and transformed. Although power is vested in the 'appropriate officer' the potentials of this power remains largely untapped (Kakulu, 2014).

11. LAND USE AND MARINE POLLUTION

Municipal wastewater discharges are severely impacting human health and sustainable development along the African, Caribbean and Pacific (ACP) coastlines. The United Nations Environment Programme Global Programme for Action for the Protection of the Marine Environment from Land-based Activities (UNEP/GPA), with its global mandate to reduce land-based sources of marine pollution, acted to assist governments and municipalities address

future of farm incomes streams and proposed a multi-disciplinary approach to the contaminated land valuation (CLV) process, and the development of a model which can be used in the valuation of contaminated land. The suggested model emphasizes the need for professional valuers or appraisers to play a more specialist and technical role during a post-impact environmental assessment survey, particularly during the analysis and interpretation of the results of the scientific investigation. Within the context of income growth or reduction of existing incomes because of the impact, the involvement of the valuation professional can foster better understanding and clarification of the immediate; short-term; medium and long-term implications of the impact, on soil productivity and consequently the income profile of land resources which is an essential requirement for valuation.

Valuation of contaminated land for compensation following a post impact environmental assessment survey is complex and better approached in a multi-disciplinary context. In Nigeria, the process suffers several challenges ranging from a dearth of technical competence, lack of consistent, clearly documented and transparent procedures, and the difficulty with valuation methods spread across different enactments and statutes making it subject to multiple interpretation. Typically, a pre-investment Environmental impact assessment (EIA) is an important procedure for ensuring that the likely effects of new development on the environment are fully understood and considered before the development can proceed. This is different from a post impact assessment which occurs following environmental pollution which often results in extensive harm to the bio-geophysical environment and damage to personal property. In some cases, rural communities suffer losses that accounts for considerable

constraints and a visible pattern has emerged. Communities in pipeline networks have very few development options due to ROW and access restrictions. The model represents a sustainable approach to development that will unlock pipelines-locked lands. It proposes a sustainable approach to layout planning that will take into consideration the existing constraints already in place prior to urbanization due to urban sprawl. This should be done with minimum disruption to the livelihoods of peri-urban areas into which it is sprawling and not the other way round.

9.5 Developing the radians and spirals

Using the earlier findings from previous studies (Kakulu, 2007 and Kakulu, 2012), I suggest opening up three additional roads off the existing Igbo-Etche road in order to release the development potentials of the Igbo-Etche area and neighbourhood farmlands. These roads will take off at a tangent off the existing Igbo-Etche road running parallel to the NAOC gas pipeline. This will open up the entire area to property developers and will follow planning control legislation by the Greater Port Harcourt Capital Development Authority. It will encourage property development to move outwards from the Port Harcourt Eleme Junction axis towards Igbo Etche as shown in Fig.3.

Secondly, the Etche Local Government Area should seek to commence development within the Igbo Etche communities and should initiate road projects which expand the traditional and historical farm track roads that existed before the pipelines because these have a place in the history and development of these settlements as well as their traditional trading routes. By upgrading these roads to proper roads for vehicular traffic, the spirals combine with radians to build the spider's web pattern even though it is too large to be visible on

the ground. Fig.3 is based on the approximate locations of the existing track farm roads currently in use and clearly visible from satellite images. Negotiations for crossing at these three points should have been done during the initial stages.

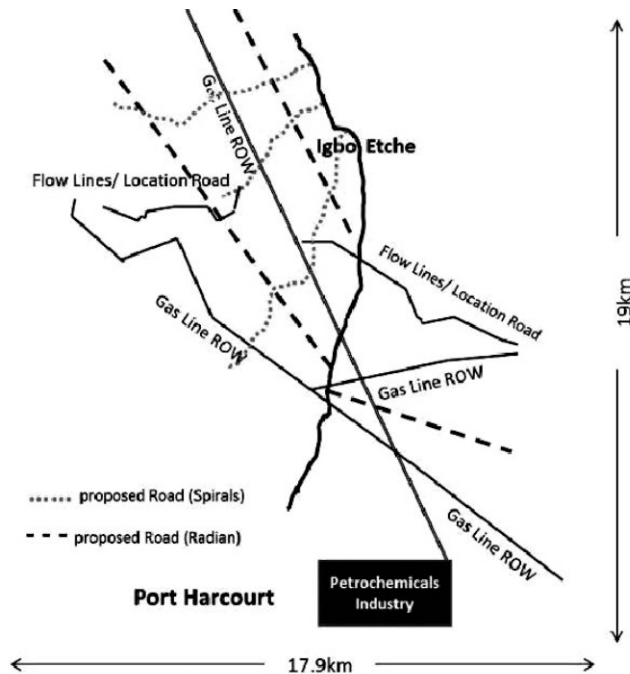


Figure 3 - Proposed New Road(s) made up of Radians and spirals (Source: Kakulu, 2012:767)

10. LAND DAMAGE AND COMPENSATION

10.1 Compensation Rates Research

In a desire to contribute to the transformation process in the current inefficient and often counterproductive oil spill management and compensation system in Nigeria, the Stakeholder Democracy Network (SDN) on behalf of the National Oil Spill Detection and Response Agency (NOSDRA) and with funding from the Dutch Ministry of

for houses which had been completely destroyed leaving only a visible foundation and rubble. We had to overcome a major challenge which was to value properties that had recently been destroyed and were technically not visible at the time of the valuation. The solution was found in the development of a novel reconstructive valuation methodology which attempted to remodel the building from its foundation using the information provided by the owner and verified by other family members present during data capture. Photo-documentation was done. The simulation of the data collected was enabled using a computer software programme designed and developed by Kalverwood Systems (Kakulu, 2003).

The Kalverwood's compensation valuation software is the brainchild of Engr. Laurie Kakulu. It enabled the team process already collected data consisting of measured floor area, identified construction materials and finishes, including the age of the building to arrive at a realistic replacement cost compensation estimate that could be defended in any court of law. The reconstructive valuation model can be used for relief and compensation arising from disasters such as flooding.

10.4 Post Impact Surveys and Compensation Valuation

In a study on Post Impact Environmental Assessment Surveys and Contaminated Land Valuation for Compensation in Nigeria, **Kakulu** (2014) asserts that a fundamental basis of land and property valuation is the identification of an income stream which forms the basis of valuation. Where an established income stream has been interfered with because of pollution or any other disruption, the extent of interference can be capitalized to determine the quantum of compensation. I conducted a theoretical review of the processes involved in establishing the relationship between contamination and the

processing of claims for payment of compensation to victims affected by the Iraq's unlawful invasion of Kuwait in 1990-1991, vis-à-vis the procedures of damage assessment.

Valuation for damage involves not only an application of valuation principles or 'best practice' methods but an understanding of the interplay of various legislation, regulations policies and more importantly environmental issues. In order to formulate an appropriate valuation method for damages, there is the need to review the statutory provisions for damage assessment for compensation in Nigeria. With funding from the Tertiary Education Trust Fund (TETFund) I am currently undertaking further research in this area which would be concluded in 2020.

10.3 Odi Disaster and Reconstructive Valuation

Following a military raid on the Odi community in Bayelsa State, Nigeria in November 1999, valuable landed properties were destroyed - *land abuse*. In 2000, a committee on 'The rebuilding of Odi' was appointed by the Bayelsa State Government to conduct a comprehensive damage assessment of the losses sustained by the people of Odi. I was invited by the committee to participate in this assignment and to specifically lead the damage assessment team to *value destroyed properties for possible compensation*. This assignment involved trekking the length and breadth of Odi working with a large team of 14 persons comprising of students from the Faculty of Environmental Sciences of the Rivers State University, field assistants and community representatives in each of the field teams who served as interpreters.

The field team spent 2 weeks in Odi documenting and verifying the claims made by the victims for losses sustained. Amongst the claims by individuals and families, were claims

External Affairs, facilitated a research on 'New Compensation Rates and Mechanisms in Nigeria'. The study in **Kakulu**, Mumeya, Okorji, Izebe and Wokoma (2014), highlights the unsuitability of the provisions of the Land Use Act in the Valuation of Contaminated lands and suggests a series of reforms in this regard. The Research report entitled New Compensation Systems and Mechanisms for the Oil and Gas industry in Nigeria, highlights the inequities of the existing processes and methods particularly the lack of transparency and inability of the current statutory practice methods to achieve just, fair, equitable, equivalent nor adequate compensation. We adopted a case-study and grounded theory research strategy and reviewed the laws and regulations on damage assessment and compensation operational within different sectors of the oil and gas industry revealed several gaps and lapses. A comparative analysis was done of existing compensation rates currently in use in Nigeria.

The findings reveal that Nigeria lacks a distinct compensation code which specifies the processes and methods that are to be applied in compensation assessment and payment arising under different circumstances. What exists in Nigeria, is a plethora of separate and often conflicting enactments regulating the practice in different sectors and which is often subject to multiple interpretation. The findings also reveal that the traditional and rather primitive practice of crop enumeration (numerical counting) and the use of historical predetermined rates as a multiplier to arrive at the compensation value, is not only professionally incorrect but lacks any scientific capacity to deal with the impact of oil pollution on the immediate, medium-term and long-term impact on land and environmental resources.

The study concludes that the use of historical or predetermined rates such as the 1997 Oil Producers Trade Sector (OPTS) Rates, the 1998 Department of Petroleum Resources (DPR) Rates, the rates operational at the State level or the more recent 2008 NTDF compiled Rates to value contaminated land or damaged marine resources, is not consistent with the principles of valuation or international valuation standards and should be discontinued and replaced with actual valuation as at the date of loss. The compensation assessment process requires a thorough scientific and technical approach to uncover the full impact of the spill on property and all other media prior to ascribing monetary or other values to the loss through valuation.

Kakulu et. al (2014) recommends that if a new compensation system, mechanism or process is to be initiated by NOSDRA, it should as a minimum, address the underlisted issues in a clear, concise and unambiguous manner:

1. Once a spill has occurred, the appropriate authorities led by NOSDRA, should establish the source and cause of spill, nature of pollutant and assign liability.
2. The appropriate authorities should assess the magnitude/scale of the spill in terms of its spatial impact and volume, and not only the recorded barrels of crude spilled.
3. The spatial impact should include the physical area which covers the source, pathway and receptor communities, as well as its depth of impact.
4. The process should include an immediate post impact environmental assessment (PIEA) study which will lead to cleanup, compensation and remediation.

5. The new process should incorporate a post impact socio-economic survey (PISS) that will lead to compensation for other artisanal industries that will be affected by the spill ultimately.
6. The process should ensure that the valuation professional is engaged on all matters of valuation of landed property as specified in the Estate Surveyors and Valuers Registration Act, on behalf of both the claimants and the Polluter.
7. The New process should ensure transparency in the identification of genuine claimants and ensure that prompt payment of adequate compensation is made.
8. It should also ensure that both parties have access to courts of law to seek redress or other compensation tribunal as provided for in the Nigerian Constitution and other enactments.

10.2 Heads of Claim and Compensation

In valuation for compensation, the term 'heads-of-claim' refers to the approved items under which claims can be made for compensation in any given instance. Different legislations provide for a list of Heads-of-Claim which makes it difficult to include items that are not listed in a damage assessment valuation. The advantage of a predetermined list is essential for uniformity in the presentation of claims for the same damage by different individuals. However, it could also pose a challenge where it is not exhaustive enough to cover all envisaged claim items, and no provision is made within the enabling statute for the inclusion of other items not listed. **Kakulu (2018)** revisits damage assessment and Heads-of-Claim in valuation for compensation. In this paper, I review the processes and methods adopted by the United Nations Compensation Commission (UNCC), in the