



**INTERNATIONAL ASSOCIATION FOR PROMOTING  
GEOETHICS IN NIGERIA**  
IN COLLABORATION WITH  
**RIVERS STATE UNIVERSITY, PORT HARCOURT**



PRESENTS:  
**First Nigeria  
Geoethics  
Conference (NGCI)**

**The International Geoethics Day 2018**

THEME:  
**Integrating  
Geoethics** into the  
**Extractive Industry  
Governance**



**SUB-THEMES**

- ▶ Environmental and social responsibility.
- ▶ Utilizing citizen science as a new paradigm for tackling security challenges and intelligence gathering.
- ▶ Communications, experiences, approaches and concepts in geoscience education.
- ▶ Geo-risk management for safer and more resilient society.  
Making geoethics a central issue in the conduct of scientists.
- ▶ Ethical considerations in developing young geoscientists and defining avenues for geoscience in Nigeria.

**DATE: 18th - 19th Oct., 2018**

**TIME: 9:00am daily**

**VENUE: Rivers State University Auditorium, Faculty of Law**

*This day aims to increase the awareness in developing an ethical framework within which geoscientists can conduct their research, professional, education and outreach activities.*



## CHAIRMAN



**HON. OBINNA CHIDOKA**

Chairman House Committee on Environment  
House of Representative



## CO- CHAIRMAN



**PROF. BLESSING CHIMEZIE DIDIA**  
**MBBS, MD(UPH), FASN, FSECAN**

Vice Chancellor Rivers State University



## HOST/ CONVENER



**ARINZE HARRISON I.**  
ENGR, MNMGS, IAPG  
National Co-ordinator  
IAPG- Nigeria



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## PROGRAMME OF EVENT

### Opening Ceremony

**Chairman**

- Hon. ObinnaChidoka

**Co –Chairman**

- Prof. Blessing ChimezieDidia

**National Coordinator**

- Mr. Arinze Harrison Ikwumelezech

**Rapporteur**

- Mr. Greg Odogwu

9:00am

- Registration of Participants

9:15am

- Arrival of Dignitaries

10:00am

- National Anthem

10:15am

- Welcome Address by National Coordinator

10:30am

- Statement by Silvia Peppoloni

10:50am

- Keynote Address by the Chairman  
(Hon. Obinna Chidoka)

11:10am

- Keynote Address by Vice – Chairman  
(Prof. Blessing ChimezieDidia)

11:40am

- Vote of Thanks by Mr. Felix Odunze

11:50am

- National Anthem/Departure of special guest of honor



## SPEAKERS AND SUB – THEMES

**Rapporteur:** Mr. Greg Odogwu

- 12:00pm Video Lecture on GEOETHICS by Silvia Peppoloni  
(IAPG – Secretary General)
- 12:40pm **Sub – Theme 1: Geoethics: Approach and concept in Geosciences Education (Prof. Charles O. Ofoegbu)**  
*Director – Institute of Geoscience and Earth Resources  
Nasarawa State University Keffi, Nasarawa State*
- 1:00 pm LUNCH BREAK
- Afternoon Session**
- 1:30 pm **Sub – Theme 2: Geoethics: A central issue in the conduct of Geoscientist (Prof. Uriah Alexander Lar)**  
*Chair-Holder Petroleum Technology Development Fund (PTDF)  
Professorial chair in Geology, University of Jos*
- 2:00 pm **Sub – Theme 3: Ethical Consideration in Developing Young Geoscientists and Defining Avenues for Geosciences in Nigeria (Ass. Prof. Timothy Bata)**  
*Head of Department of Geology ATBU Bauchi*
- 2:30pm **Sub – Theme 4: Geoethics: Georisk management for a safer and more resilient Society (Dr. H.O Nwankwoala)**  
*Senior Lecturer, Department of Geology University of Port-Harcourt*
- 3:00 pm **Sub – Theme 5: Geoethics; Environmental and Social Responsibility (Mr. Fynneface Dumnamene)**  
*Youth and Environmental Advocacy Centre Port - Harcourt*

### **Paper Presentations:**

Paper presentation by **Oguche Christopher & Andrew Noah**  
(University of Abuja, Department of Geography and Environmental Sciences)

**Title: Analysis of the risk of land development on flood plain areas of trade more estate and environs in lugbe, Abuja.**

(University of Abuja, department of Geography and environmental sciences)



## LIST OF L.O.C MEMBERS

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## ACKNOWLEDGEMENT

The immense contribution of the editorial team and authors are hereby acknowledged by the L.O.C

We thank the following for their contributions to the successful hosting of this conference:

- IAPGN – International Association for Promoting Geoethics Nigeria wishes to thank Rivers State University, Port Harcourt to have permitted the use of its Auditorium for organizing the first national Conference on Geoethics in Nigeria.

We say many thanks to the Vice-Chancellor – Prof. Blessing Didia

- The International Association for Promoting Geoethics – IAPG our very own for their financial support and encouragement at promoting those values and in the primary duty of geoscientists to put their knowledge at disposal of others, to better serve society, to protect the environment, to defend population from natural risks, and assure the sustainable development for future generations.
- Many thanks to the Managing Director Geomarine Systems Limited for your kind support



**DR. SILVIA PEPPOLONI**  
IAPG - Secretary General

### FORWARD

Rome (Italy), 18th October 2018

**Subject: NGC1 - First Nigeria Geoethics Conference, Port Harcourt (Nigeria), 18-19 October 2018.**

Dear: Hon. ObinnaChidoka, Chairman House Committee on Environment (Chairman); Prof. Blessing ChimezieDidia, Vice-Chancellor Rivers State University (Vice-Chairman); Prof. Charles Ofoegbu, Director of the Institute of Geosciences and Earth Resources, Nasarawa State University; Professor Uriah Lar, Professorial

Chair in Geology at the University of Jos; Ass. Prof. Timothy Bata, Head of Department Geology ATBU Bauchi; Dr. H.O Nwankwoala, Senior Lecturer at the Department of Geology, University of Port-Harcourt; Mr. FyनेfaceDumnamene, Youth and Environmental Advocacy Centre of Port-Harcourt; Mr. Arinze Harrison Ikwumeleze, Coordinator of the IAPG-Nigeria.

On behalf of the IAPG - International Association for Promoting Geoethics, I express my heartfelt thanks to IAPG-Nigeria for organizing this important conference in Africa. This conference is an indispensable opportunity to share and promote the ethical, social and cultural values that underlie and give sense to our activity as geoscientists for the benefit of society. The IAPG strongly believes in those values and in the primary duty of geoscientists to put their knowledge at disposal of others, to better serve society, to protect the environment, to defend populations from natural risks, to assure the sustainable development for future



generations. The IAPG-Nigeria is certainly one of the most proactive IAPG sections in Africa, and is helping to promote Geoethics and the IAPG vision at all levels within society despite great difficulties. The current global challenges facing our human communities require geoscientists increasingly prepared and aware of their responsibilities towards society and the environment. The IAPG believes that Geoethics must become a new way of thinking about the way humans interact with the Earth system. We must change the cultural paradigm that governs this interaction, and events such as the International Geoethics Day and this Conference in Nigeria want to contribute to achieve this goal. A responsible and prudent management of natural resources, a preventive defense against natural hazards, the education of citizens to a scientific knowledge of phenomena and natural dynamics is an ethical duty of our societies and geoscientists can contribute to these global goals. Geoscientists know the limits of the sustainability of geo-resources; they know areas most at seismic, hydrogeological, volcanic risk; they possess scientific knowledge that can be a benefit for the whole society. Therefore, geoscientists have the ethical duty to act for the good of all, for the benefit of the environment, to ensure future generations a planet free from pollution and rich in bio- and geodiversity. The conference in Port Harcourt is the most important event of the IAPG to celebrate the second edition of the International Geoethics Day. Today, Port Harcourt is the heart of the IAPG. And all the great international community of the IAPG is here with you, it is attending the conference with its soul, and with you it celebrates the Geoethics Day in every part of the world. The conference organized by IAPG-Nigeria is a brick, a little brick, to build a better future for everyone. A good job to all.

### **"Cape Town Statement on Geoethics"**

IAPG considered the 35th IGC - International Geological Congress, held in Cape Town (South Africa) in 2016, the event that opened a new phase for Geoethics and for the Association. In order to celebrate this passage, the IAPG Drafting Committee, formed by Giuseppe Di Capua, Peter Bobrowsky and Silvia Peppoloni, put together the "Cape Town Statement on Geoethics" (CTSG), a document to be considered as the product of an international effort to focus the attention of geoscientists on the development of shared policies, guidelines, strategies and tools, with the long-range goal of fostering the adoption of ethical practices in the geoscience community. The final document sums up all the values, concepts, contents developed in the first 4-year activity of IAPG, giving a perspective for the future development of geoethics. The CTSG was announced during the opening keynote speech by Silvia Peppoloni (IAPG Secretary General) in the first [IAPG session on geoethics at the 35th IGC](#). After the congress, the draft version was sent for comments and suggestions to all the IAPG officers (members of the Executive Council, Coordinators of the National Sections, Corresponding Citizen Scientists) and to the 35th IGC Champions of the Theme "Geoscience Professionalism and Geoethics".



Once improved (thanks in particular to NicBilham, Martin Bohle, Emilia HermelindaLoperaParejas, David Mogk), the final version was ratified by the Executive Council of the IAPG and finally published in the IAPG website.

The Cape Town Statement on Geoethics can be cited as follows:

[Di Capua G., Peppoloni S. and Bobrowsky P.T.\(2017\). The Cape Town Statement on Geoethics. Annals of Geophysics, Vol. 60, Fast Track 7,doi: 10.4401/ag-7553](#)

The Cape Town Statement on Geoethics is available in 35 languages:

Afrikaans, Albanian, Arabic, Armenian, Belarusian, Bengali, Czech, Danish, Dutch, English, French, Georgian, German, Greek, Hindi, Hungarian, Italian, Japanese, Korean, Mandarin Chinese, Nepali, Norwegian, Persian, Portuguese, Romanian, Russian, Sepedi, Serbian, Slovenian, Spanish, Swahili, Tamil, Turkish, Ukrainian, Urdu.

The IAPG publication that collects the Cape Town Statement in 35 languages is for free download, and can be cited as follows:

[Peppoloni Silvia \(ed.\) \(2018\). Spreading geoethics through the languages of the world. Translations of the Cape Town Statement on Geoethics. International Association for Promoting Geoethics \(IAPG\), <http://www.geoethics.org/ctsg>](#)

## **Cape Town Statement on Geoethics**

### **Preamble**

The concepts, values and views on individual responsibilities of geoscientists, expressed in the “Cape Town Statement on Geoethics” reflect an international consensus. The statement aims to capture the attention of geoscientists and organizations, and to stimulate them to improve their shared policies, guidelines, strategies and tools to ensure they consciously embrace (geo)ethical professional conduct in their work.

### **Introduction**

Geosciences have major impacts on the functioning and knowledge-base of modern societies. Geoscientists have specific knowledge and skills, which are required to investigate, manage and intervene in various components of the Earth system to support human life and well-being, to defend people against geohazards and to ensure natural resources are managed and used sustainably. This entails ethical obligations. Therefore, geoscientists must embrace ethical values in order best to serve the public good.

Geoethics is an emerging subject, which promotes a way of thinking and practicing geosciences, within the wider context of the roles of geoscientists interacting with colleagues, society and the planet.



Only by guaranteeing the intellectual freedom of researchers and practitioners to explore and discover in the Earth system, is it possible for geoscientists to follow ethical approaches in their work. Likewise, only by increasing researchers' and practitioners' awareness of the ethical implications of their work is it possible to develop excellent geoscience to serve society and to reduce the human impact on the environment.

### **Definition of Geoethics**

Geoethics consists of research and reflection on the values which underpin appropriate behaviors and practices, wherever human activities interact with the Earth system. Geoethics deals with the ethical, social and cultural implications of geosciences knowledge, education, research, practice and communication, and with the social role and responsibility of geoscientists in conducting their activities.

### **Purpose**

Embracing geoethics is essential: to improve both the quality of professional work and the credibility of geoscientists, to foster excellence in geosciences, to assure sustainable benefits for communities, as well as to protect local and global environments; all with the aim of creating and maintaining the conditions for the healthy and prosperous development of future generations.

### **Fundamental Values of Geoethics**

1. Honesty, integrity, transparency and reliability of the geoscientist, including strict adherence to scientific methods;
2. Competence, including regular training and life-long learning;
3. Sharing knowledge at all levels as a valuable activity, which implies communicating science and results, while taking into account intrinsic limitations such as probabilities and uncertainties;
4. Verifying the sources of information and data, and applying objective, unbiased peer-review processes to technical and scientific publications;
4. Working with a spirit of cooperation and reciprocity, which involves understanding and respect for different ideas and hypotheses;
5. Respecting natural processes and phenomena, where possible, when planning and implementing interventions in the environment;
6. Protecting geodiversity as an essential aspect of the development of life and biodiversity, cultural and social diversity, and the sustainable development of communities;
7. Enhancing geoheritage, which brings together scientific and cultural factors that have intrinsic social and economic value, to strengthen the sense of belonging of people for their environment;



8. Ensuring sustainability of economic and social activities in order to assure future generations' supply of energy and other natural resources.
9. Promoting geo-education and outreach for all, to further sustainable economic development, geohazard prevention and mitigation, environmental protection, and increased societal resilience and well-being.

### **Geoethical Promise**

The adoption of the following Hippocratic-like oath (the “Geoethical Promise”) by early-career geoscientists is proposed, to promote respect for geoethics values in geoscience research and practice:

*I promise...*

*... I will practice geosciences being fully aware of the societal implications, and I will do my best for the protection of the Earth system for the benefit of humankind.*

*... I understand my responsibilities towards society, future generations and the Earth for sustainable development.*

*... I will put the interest of society foremost in my work.*

*... I will never misuse my geoscience knowledge, resisting constraint or coercion.*

*... I will always be ready to provide my professional assistance when needed, and will be impartial in making my expertise available to decision makers.*

*... I will continue lifelong development of my geoscientific knowledge.*

*... I will always maintain intellectual honesty in my work, being aware of the limits of my competencies and skills.*

*... I will act to foster progress in the geosciences, the sharing of geoscientific knowledge, and the dissemination of the geoethical approach.*

*... I will always be fully respectful of Earth processes in my work as a geoscientist.*

*I promise!*

### **Final Statement**

It is essential to enrich the roles and responsibilities of geoscientists towards communities and the environments in which they dwell, as well as paying attention to each scientist's individual conscience and relationships with colleagues. Human communities will face great environmental challenges in the future. Geoscientists have know-how that is essential to orientate societies towards more sustainable practices in our conscious interactions with the Earth system. Applying a wider knowledge-base than natural sciences, geoscientists need to take multidisciplinary approaches to economic and environmental problems, embracing (geo)ethical and social perspectives. Geoscientists are primarily at the service of society. This is the deeper purpose of their activity.



In the coming years, especially when addressing matters like energy supply, use of geo-resources, land management, pollution abatement, mitigation of geo-risks, and climate change adaptation and mitigation, ethical and social issues will be central in scientific discussion and in public debate. In addition, handling large quantities of data, science and risk communication, education strategies, issues of research integrity, anti-harassment and anti-discrimination policies, gender balance and inclusion of those living with disabilities will be major topics for geoscientists.

Raising the (geo)ethical awareness and competences of the members of the geoscience community is essential, also to increase trust and credibility among the public. This can best be achieved in the near future by two means: by promoting more effectively existing guidance such as codes of ethics/conduct and research integrity statements; and by introducing geoethics into geoscience curricula, to make geoethics a basic feature of the training and professional activity of geoscientists.

## **AGREEMENT**

Memorandum of Understanding between the International Association for Promoting Geoethics – IAPG and Geoscientists Canada - GC

### **GC - Geoscientists Canada/Géoscientifiques Canada**

The GC and the IAPG have signed a Memorandum of Understanding on 22 September 2018. The aim of the MoU is to assure a continued IAPG-GC cooperation and coordination on issues of common interests, in particular, the following:

- promotion of principles of ethics, research integrity, and professional ethical deontology in geoscience activities among their networks;
- definition of ethical issues, with accompanying case-studies, where appropriate, affecting the geoscience community and organizations;
- co-organization of scientific events to disseminate concepts of ethics in geoscience, among both the professional and research communities, with particular attention to young geoscientists;
- production of relevant publications and communications.

GC (<https://geoscientistscanada.ca/>) is the national organization of the 9 provincial and territorial regulatory bodies that govern Canada's professional geoscientists and geoscientists-in-training. Geoscientists Canada co-ordinates development of high national standards of admissions, competency, practice and mobility to ensure that Canada is served by a skilled, versatile, reputable and accountable geoscience profession.





## ABSTRACTS

### **GEOETHICS: APPROACH AND CONCEPT IN GEOSCIENCE EDUCATION**

**PROFESSOR CHARLES O. OFOEGBU**

*Director of Institute of Geosciences and Earth Resources (IGER) Nassarawa State University Keffi, Nasarawa State.*

#### **ABSTRACT**

Geoethics covers values that ensure proper behaviour and practices whenever human activities interface with the geosphere. It covers the relationship between geoscientists society and the earth. Geoethics encompasses responsible values and high professional standards required of geoscientists as they seek to serve society. It seeks to encourage high ethical, social and cultural values in geoscientific research practice and education. The Concept and approach of Geoethics in Geoscience Education will be discussed in the presentation. Ethical issues in Geoscience Education (Training and Practice) will be discussed and the need for Geoethics in Geoscience Education addressed and justified.

### **GEOETHICS IN ENGINEERING GEOLOGY AND THE ENVIRONMENT**

**E. O. ESU, FNMGS, FNAEGE**

*Department of Geology, University of Calabar, Nigeria*

#### **ABSTRACT**

The recognition of expected responsibilities of the geoscientists to the society, environment and the geoscientists themselves, is one of the main purposes of geoethics. Personal and professional attitudes to issues differ. Hence, the peaceful conduct/practice of any science subject including engineering geology, requires some standard way or manner of practice that can protect the practitioner, engender public trust in the research findings, satisfy the society and also preserve the environment for future generations. Such a standard is called the code of practice. Other disciplines have put their codes of practice in place. We in engineering geology also need to develop an acceptable way of practicing our discipline. Teaching of geoethics as an interdisciplinary science can help us to do this. Good intra-disciplinary relationship/behaviour between practitioners, adequate training and retraining of geoscientists to prepare them for the needs of a constantly changing world, can promote greater understanding of acceptable and unacceptable professional behaviour in the work environment. Unprofessional issues such as plagiarism, fabrication or falsification of data, and the wrong use of power often lead to mistrust and lack of respect between practitioners in the geosciences. Geoethics can address these cases and cause general public acceptance of geoscientific research results and also rely on the quality of the quality of their products.



## **MAKING GEOETHICS A CENTRAL ISSUE IN THE CONDUCT OF GEOSCIENTISTS**

**LAR, URIAH ALEXANDER**

*Professor/PTDF Chair Professor of Geology, University of Jos, Jos, Nigeria*

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### **ABSTRACT**

Ethics like moral, deals with the guiding principles that control or influence a person's behavior, specifically with the distinction between right and wrong. Geoethics or Geoscience ethics has its foundation on general morality focusing on responsible professional conduct of geoscientists. Geosciences address issues that are central to the progress and the development of the society such as natural hazards, climate change, exploitation of mineral resources, air/water pollution and other environmental issues etc. The ill- preparedness of the society to confront these natural/man-made phenomena, could have a long-term devastating effect on the human population. The core responsibility of Geoscientists therefore, is to guide the public towards an improved and sustainable environmental concerns based on robust scientific facts and technological know-how. Geoethical framework (Geoethics) ensures that quality of work, professional integrity and public confidence are of high priority. Geoethics will foster dissemination of accurate geoscientific information and enhance understanding between the geoscientists, policy-makers, mass media and the general public. As a step in the right direction, there exists the Council for Mining Engineers and Geoscientists (COMEG) here in Nigeria, which is a regulatory body that guides the ethical professional conduct and responsibilities of Geoscientists and Mining Engineers. In 2016, the International Association for Promoting Geoethics (IAPG) (<http://www.geoethics.org>) articulated a code of conduct known as the "Cape Town Statement of Geoethics" that applies to members of all Geosciences societies world-wide. Geoscientists are all better when Geoethics becomes central in discharging their responsibilities.

**KEYWORDS:** *Geoethics, IAPG, Society, Geoscientists, Environment, Nigeria.*

## **ETHICAL CONSIDERATION IN DEVELOPING YOUNG GEOSCIENTIST AND DEFINING AVENUES FOR GEOSCIENCE IN NIGERIA**

**DR TIMOTHY P. BATA**

***Associate Professor of Petroleum Geology/Sedimentology (HOD) Department of Applied Geology, Abubakar Tafawa Balewa University Bauchi***

### **Abstract**

Geoscientists are curious about the Earth, its resources and environment. They work to





understand natural processes on Earth by exploring its rocks, oceans, and atmosphere. Like any other profession, Geoscience is governed by a system of moral principles (Geoethics) that controls how geoscientists provide vital information for solving problems and establishing governmental policies in resource management and environmental protection. Geoethics inspires a critical investigation in the use and management of natural resources as well as promoting their eco-friendly development. The future of Geoscientists is bright in Nigeria as the country is endowed with numerous natural resources. Young Geoscientists are therefore encouraged to practice their professional skill and judgement to the best of their ability, acting in all matters towards their clients, employers and all others with whom their work is connected in an honourable and ethical way in keeping with the highest professional standards.

## **GEOETHICS: GEORISKS MANAGEMENT FOR A SAFER AND MORE RESILIENT SOCIETY**

**DR. H.O NWANKWOALA**

***Senior Lecturer, Department of Geology, University of Port – Harcourt***

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Geoethics deals with the ethical, social and cultural implications of geoscience knowledge, education, research, practice and communication, and with the social role and responsibility of geoscientists in conducting their activities. Geoethics recognizes that human beings are a geological force capable of acting on natural environments, and in virtue of this prerogative assigns to them an ethical responsibility towards the Earth system. Studying and managing the Earth system, exploiting its geo-resources, intervening in natural processes are actions that involve great responsibilities towards society and the environment are the exclusive reserve of geoscientists. Georisks and hazards occur frequently now in Nigeria and are primarily due to any geological event, processes, activity, condition or environment. The potential hazards include: earthquakes, tremors, severe weather and Floods, sea level rise, seismic activity, shoreline erosion, etc. It is very important to understand the full spectrum of geohazards, including the extreme events, as a prerequisite for disaster risk management and increased resilience to these events. The gap in scientific understanding and lack (absent or not enforced) of adequate disaster risk management system, mechanisms, funds, plans, guidelines, manuals, procedures, rules and laws for undertaking safer sustainable development is primarily responsible for community's exposure to hazards and their impacts leading to colossal death, huge economic and environmental loss as well as delayed or inefficient response and recovery. This paper therefore, asserts that any attempt to reduce the incidences and impacts of these potential disasters would require a good scientific



understanding of the hazards and the likely vulnerabilities of the elements at risk as well as enhanced capacities to avert, avoid, prevent, mitigate, resist and recover the risks within acceptable socio-economic limits. In this regards, the responsibilities of geoscientists to improve both the quality of professional work and their credibility to foster excellence in geosciences, to assure sustainable benefits for communities, as well as to protect local and global environments is vital; all with the aim of creating and maintaining the conditions for the healthy and prosperous development of future generations.

**Keywords:** *Geoethics, georisks, geohazards, disaster risk management, ethical responsibility, Environmental sustainability*

## **GEOETHICS: ENVIRONMENTAL AND SOCIAL RESPONSIBILITIES**

**FYNEFACE DUMNAMENE**

***Youth and Environmental Advocacy Centre Port - Harcourt***

The title of this paper is “**GeoEthics: Environmental and Social Responsibilities**”. According to the International Association for Promoting GeoEthics (IAPG), GeoEthics consists of research and reflection on the values which underpin appropriate behaviours and practices, wherever human activities interact with the Earth system. Geoethics deals with the ethical, social and cultural implications of geosciences knowledge, education, research, practice, communication and, with the social role and responsibilities of geoscientists in conducting their activities. It is in view of this that this paper critically examines geoethics from environmental and social responsibilities' perspectives and seeks to relate geoethics to those values upon which appropriate environmental behaviours, social roles and responsibilities should be premised in society. Using the GeoEthics theory which deals with ethical relations of humans with inorganic nature, restraint of the rights and needs of humans in relation with inorganic nature, the paper laconically points out the social role and responsibilities of members of the society to their surrounding environment. The paper argues that GeoEthics represents an opportunity for members of the society to become more conscious of their social role and responsibilities to the society and environment in conducting their activities and a tool to influence the awareness of the society regarding problems related to geo-resources and geo-environment. The paper concludes with recommendations and guidelines for effective behaviour especially among young people in addressing concrete problems of human life by trying to find solutions to environmental challenges, protection of Nature and land in the Niger Delta and Nigeria in general.



## **ANALYSIS OF THE RISK OF LAND DEVELOPMENT ON FLOOD PLAIN AREAS OF TRADE MORE ESTATE AND ENVIRONS IN LUGBE, ABUJA.**

**OGUCHE CHRISTOPHER JOSEPH &<sup>2</sup>ANDREW NOAH REIGNS**

***Department of Geography and Environmental Management, University of Abuja, Abuja  
Department of Geography Nigeria Defence Academy, Kaduna, Nigeria.***

*Corresponding Authors Email: christodreams1@gmail.com*

### **Abstract**

*Trademore Estate is situated in Lugbe, along Airport road, Abuja. The estate covered an area of about 24km square. The location of the estate along two major water courses in Lugbe town of Abuja has brought about annual flood disaster that destroys properties and disrupts human activities in the area. Residents of the estate are threatened annually by incessant flood, leading to untold expenditure and an ever adjusting lifestyle in order to cope with the flood menace. The study aimed at using geospatial analysis to assess the risk of land development on flood plain areas of Trademore Estate and environs in Lugbe, Abuja, as the area is vulnerable to flood disaster. The research focused on the use of remotely sensed data and GIS techniques for terrain analysis for flood disaster vulnerability assessment of Trademore estate. The data used for the study include 2010 Base map, Geographic coordinates, 2015 Google earth image and 2015 SRTM of the study area. Digital Elevation Model (DEM) of the estate and its environs was created for reclassification of elevation differences. From the Digital elevation model extracted from SRTM data and flow direction map created, the areas liable to flooding within Trademore and its environs was also determined and their vulnerability level evaluated, and this lies between 65 to 95 meter above sea level. It was discovered that many structures, business centers, housing facilities, roads and bridges were found to be trapped within the flood plain. The study concluded that geospatial tools were very necessary in assessing the terrain of the area and identify areas liable to flood even before constructions and settlement should commence in such terrain. The study recommended the re-location of some houses and business facilities and constant monitoring of the estate especially in the rainy season and public enlightenment on adherence to early flood warning and mitigation measures should be taken serious.*

**Keywords:** Flood, vulnerability, Terrain analysis, Remote sensing.



# SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD



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