**8TH NATIONAL CONFERENCE ON ENVIRONMENT AND HEALTH**

*(Organized by the LivingScience Foundation, Ile-Ife* CAC/IT/91834)

**Venue: Precious Cornerstone University, Ibadan, Oyo State, Nigeria + Online via Zoom**

**Date: Tuesday October 17 - Wednesday October 18, 2023**

# BOOK OF ABSTRACTS

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The NJEH is the only journal of its kind in Nigeria that seeks, in a rigorously scholarly fashion, to bridge the gap between Science, Practice, and Policy in the field of Environment-Health. Just like our Conference series, the Journal appeals to a distinguished readership of academics, professionals, policy makers, and other key stakeholders in the environment-health sector. Our ultimate goal is translating research findings in Environment-Health into visible positive benefits for the common man in Nigeria.

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*"Science for life more abundant (John 10:10)"*

The aim of the *Living*Science Foundation is to enhance public health in Nigeria by facilitating and promoting sound, evidence-based, comprehensive and holistically-derived, home-grown environmental-health policies and practices; undergirded by a conviction that an all-wise benevolent Creator designed the world to run sustainably.

The Specific Objectives of the Foundation are to

i. provide an authoritative voice showing that studying and doing Science from a creationist perspective will not only make best sense of our world, it will also yield abundant life for people and the entire ecosystem. This will entail a direct standing up to, and scientific refutation of the currently prevalent evolution theory of origins.
ii. seriously engage in the business of identifying traditional and modern hazards peculiar to the Nigerian environment; scientifically evaluate attendant health risks particularly to identified susceptible, vulnerable, and sensitive subpopulations; and widely communicate the findings in society, while advocating for remedial actions as may be necessary.
iii. provide information, education, and advisory services on health and environment to the general public, various tiers of government, and other stakeholders. This may involve undertaking resourced projects and contract works that support the vision of the Foundation.

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# Welcome!



It gives me a great pleasure to once again welcome distinguished participants to another edition of our annual National Conference on Environment and Health – the eighth in the series.

In a rapidly globalizing world, it has become inevitable that consensus should become a major mechanism for resolving critical issues among nations. A nation that would not be pawned and short-changed at the global negotiating table would therefore need to have first done her homework thoroughly at home. This is a primary objective for us at the LivingScience Foundation, in convening this annual gathering of key stakeholders in the critical environment-health sector. We seek to promote a free exchange of ideas on a national scale, so our country could offer informed and appropriate responses to international and global developments as they arise.

Clearly, on the subject of environmental management and public health, our national interest is best served by "primary prevention" of diseases. This entails managing the environment in a way that minimizes exposures that lead to diseases; rather than struggling to later deal with the aftermaths of such exposures via sophisticated technologies that in any case have to be sourced from abroad at considerable costs.

Ironically, however, it is far easier showing people results of diseases healed, than diseases prevented! It is therefore not too surprising that many players in the health sector, including government itself, are often not too enthusiastic to go in the direction of primary prevention. Many times, vaccines and prophylactics (constituting secondary prevention mode) provide a popular middle ground.

The LivingScience Foundation is committed to promoting informed primary prevention of diseases in Nigeria. Year in, year out, we have continued to draw attention of key stakeholders to this course with our carefully selected Conference themes and Speakers. Our efforts in this regard also include our special outreach to the younger generation via the High School Workshop and Quiz that usually accompanies our national Conference.

I want to sincerely thank all who have encouraged and partnered with us in this endeavor to date. It is my prayer that the fruits of this engagement would soon begin to show in our nation, and all we shall partake in them to the glory of the almighty God.

I wish you happy and fruitful deliberations, and look forward to receiving the Communique of the Conference in due course.

Pastor Ezekiel A. Odeyemi (FRSA, ACIS)
Pro-Chancellor and Chairman of Governing Council, Reedemer's University, Ede;
Chairman, Board of Trustees, LivingScience Foundation, Ile-Ife



I am greatly delighted to welcome distinguished colleagues and partners to the 8th National Conference on Environment and Health. Conferences are essential to keep us in shape professionally, in touch with like-minded colleagues, and abreast with developments in our field. Without any doubts, your participation in this year's conference amidst the considerable uncertainties in the socio-economic milieu is a clear attestation to your patriotism, selflessness, and commitment to charting the required roadmap to a better future for our country. I especially salute those of us who made the efforts to prepare and submit Abstracts for presentation at the Conference in the midst of several other pressing commitments. Well done!

To realize the much-vaunted sustainable development for our country, it is imperative that we adopt a holistic approach in examining and managing the three dimensions of Economy, Socials, and Environment, with Health being the ultimate bottom-line. The only way to achieving this is to bring together relevant Stakeholders from various sectors, encourage them to share their peculiar experiences, so that the required solutions, customized for our clime, may emerge. No rocket science is actually necessary in this endeavor – only plain honest commonsense.

I want to particularly thank all our corporate Partners and Sponsors whose supports have made it possible for us to have a highly subsidized Conference without compromises in standards. These Partners are appropriately listed on the various branded materials produced for this Conference. Our special gratitude goes, in particular, to Dr Adeniyi Oginni, the outgoing pioneer Executive Secretary of the Osun Health Insurance Agency for his numerous intellectual and financial supports. Also, to the management of the Precious Cornerstone University for enthusiastically embracing the hosting of this edition of the Conference. This is our first foray outside the familiar comfort of our birthplace and nursery: the Redeemer's University, Ede. Thank you for making it easy for us.

I will like to remind all Presenters that there is opportunity for them to have their work published in the Nigeria Journal of Environment and Health. Any work presented at this Conference is welcome for consideration in the Journal, provided the authors are ready to diligently cooperate with the thorough editorial process and stringent timelines.

So, without much further ado, let me bid you all welcome to the "Garden of Victory", home of the Precious Cornerstone University, and venue for this promising 8th edition of the National Conference on Environment and Health.

Enjoy your stay!



Joshua Ojo (Ph.D)
Professor of Health Physics and Environment, Obafemi Awolowo University, Ile-Ife
and
President, LivingScience Foundation, Ile-Ife

**PROGRAMME SCHEDULE**

**Day 1: Tuesday 17th October, 2023**

| | |
|---|---|
| 09.00 – 09:50 | Pre-Opening Activities: Set up Exhibition and Poster Stands. |
| (09:50 – 14:10) | **PLENARY SESSION I: Formal Opening Ceremonies** |

Chairman: Rev. Bode Oluwusi (Chairman, Intercessors for Nigeria, South West; Chairman, Board of Advisers, LivingScience Foundation, Ile-Ife)
Co-Chairman: Prof (Mrs) Margaret K, Akinloye (Retired Professor of Health Physics, Ladoke Akintola University of Technology, Ogbomoso)
Rapporteurs: Dr Oluseyi Akinola (OAU) and Mrs Tolu Karokatose (University of Ilesa)

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|---|---|
| 09:50 – 10.00 | **Opening**<br>Opening Prayer**.** National Anthem. Precious Cornerstone University's Anthem<br>**Pastor (Dr) Olusola Ajibulu (Chaplaincy PCU).** |
| 10:00 – 10:05 | **Introductions –** Dr (Mrs) Oyenike **Olukiran**<br>(Head, Computing Sciences Department, PCU, Ibadan) |
| | **Welcome Addresses**: |
| 10.05 – 10.10 | **Prof Julius K. Oloke**, Vice Chancellor, Precious Cornerstone University, Ibadan |
| 10.10 – 10.20 | **Pastor Ezekiel A. Odeyemi** (FRSA, ACIS),<br>Chairman, Board of Trustees, LivingScience Foundation, Ile-Ife and<br>Pro-Chancellor and Chairman of Council, Redeemer's University, Ede |
| 10.20 – 10.30 | **Chairpersons' Opening Remarks** |
| 10.30 – 10.50 | **Goodwill Messages**<br>Dr Adeniyi S. Oginni (Executive Secretary/CEO, Osun Agency for Control of HIV/AIDS (O'SACA))<br>Emeritus Prof Abiodun F. Oluwole |
| | **Keynote Address 1**: |
| 10.50– 10:55 | Citation of Prof Amos Fatokun**.** (Dr Felix **Okunlola**, PCU, Ibadan) |
| 10.55 – 11.40 | DIOXINS AS PERSISTENT ENVIRONMENTAL POLLUTANTS: IMPLICATIONS FOR HUMAN HEALTH, MECHANISMS OF TOXICITY, AND POTENTIAL THERAPEUTIC INTERVENTIONS<br>**Amos Fatokun** |
| 11:40 – 11:55 | Interactions. Questions and Answers |
| 11:55 – 12:00 | Short Break |
| | **Keynote Address 2**: |
| 12:00– 12:05 | Citation of Dr Sunday Ojewale (Sanitarian Femi Ola, EHOAN, Osun) |
| 12.05 – 12.50 | RESPONDING TO EMERGING ENVIRONMENT-HEALTH HAZARDS IN NIGERIA<br>**Sunday Ojewale** |
| 12:50 – 13:05 | Interactions. Questions and Answers |

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| 13.05 – 13.20 | **Refreshment/Tea Break** |
| | **Prizes and Awards** |
| | A.F. Oluwole Prize for Environment-Health |
| 13.20 – 13.25 | Citation of the Winner**:** Engr (Mrs) **Adeola Olaoye** (NESREA, Osogbo) |
| | Presentation of Plaque **–** Mr Adeleke Ajani |
| 13.25 – 13.30 | Response from Award Recipient **– Engr Olufunmbi Sode** |
| 13:30 – 13:35 | High School Quiz |
| | Announcement of Winners and Award of Prizes – **Dr Oladimeji Babatunde** |
| 13:35 - 13.50 | **Chairmen's Closing Remarks –** |
| 13:50 - 13:55 | Votes of Thanks – **Dr (Mrs) Grace A. Akinlade** |
| 13:55 – 14:00 | **Closing Prayer. National Anthem - PCU Chaplaincy** |
| 14.00- 14:10 | **Group Photographs** |
| 14:10 – 15:30 | **Lunch** |

(15:30 – 17:15**)** **PLENARY SESSION II**
Chairman: **Mr Adeleke Ajani** (Retired Director, NESREA SW Zone)
Rapporteur: **Mr David Dare** (Dept of Physical Sciences, PCU)

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| 15:30 – 16:00 | CHALLENGES IN SETTING AND ENFORCING APPROPRIATE STANDARDS FOR EMERGING ENVIRONMENTAL HAZARDS |
| | **Aliyu Jauro** |
| 16.00 – 16:30 | IMPROVING THE UTILITY OF HEALTH RECORDS IN EFFECTIVE DISEASE SURVEILLANCE IN NIGERIA |
| | **Babagana Mustapha** |
| 16:30 – 16:45 | TELEMEDICINE IN THE POST-COVID ERA: BENEFITS, CHALLENGES, AND IMPLICATIONS |
| | **Nasiru Sani** |
| 16.45 – 16:55 | Short Break |
| 16:55 – 17:25 | OVERVIEW OF ENVIRONMENTAL-HEALTH PRACTICES AT THE REDEMPTION CITY OF GOD: CHALLENGES AND SUCCESSES |
| | **Stephen Simidu** |
| 17:25 – 17:55 | OVERVIEW OF NESREA'S OPERATIONS AT THE LAGOS SEAPORT: CHALLENGES AND SUCCESSES |
| | **Amara Udechukwu** |
| 17:55 – 18:05 | A MACHINE LEARNING MODEL FOR THE PREDICTION OF DIABETES |
| | **Danjuma D. Maza** |
| 18:05 – 18:15 | MEASUREMENT OF RADIATION EXPOSURE RATE AROUND QUARRY SITES IN EKITI STATE, NIGERIA. |
| | **Dolapo Olaniyan** |
| 18:15 - 18:30 | Short Break |
| 18:30 – 19:30 | Conference Cocktail |

**Day 2: Wednesday 18h October, 2023**

(09:00 – 10:00) **PLENARY SESSION III**
Chairman: Prof Nnamdi N. Jibiri, Head, Department of Physics, UI, Ibadan.
Rapporteur: Dr David Oke, Department of Accounting, PCU

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| 09:00 – 09:20 | ELECTROSMOG POLLUTION: THE RAGING QUIET EPIDEMIC<br>**Joshua O. Ojo** |
| 09:20 – 09:30 | Interactions. Q&A |
| 09:30 – 09:50 | ECONOMICS AND ENVIRONMENTAL-HEALTH RISK ASSESSMENT FOR SUSTAINABLE DEVELOPMENT OF THE GOLD MINING INDUSTRY IN NIGERIA<br>**Olugboyega Oyeranti** |
| 09:50– 10:00 | Interactions. Q&A |
| 10:00 - 10:15 | ATOMIC ABSORPTION SPECTROSCOPY OF HEAVY METALS IN CANCEROUS BREAST TISSUES AMONG WOMEN IN JOS, NIGERIA<br>**Idowu Opeyemi Peter** |
| 10:15 – 10:20 | Interactions.Q&A |
| 10:20 - 10:30 | Short Break |
| 10:30 - 10:50 | SETTING NATIONAL DOSE REFERENCE LEVELS FOR DIAGNOSTIC RADIOLOGY IN NIGERIA<br>**Rachel Obed** |
| 10:50 – 11:00 | Interactions. Q&A |
| 11:00 - 11:10 | POLLUTION STATUS AND HEAVY METAL SPECIATION OF SOIL, AT A GOLD MINING SITE, IN IBODI-IJESA, SOUTH-WEST, NIGERIA**.**<br>**Kyowe, H. A.** |
| 11:10 – 11:20 | DETERMINANTS OF HOSPITAL SOLID WASTE COMPOSITION OF OBAFEMI AWOLOWO UNIVERSITY TEACHING HOSPITAL COMPLEX (OAUTHC) ILE-IFE, NIGERIA.<br>**Temitope Famubode** |
| 11:20 - 11:30 | SKIN CANCER CHEMOPREVENTION THROUGH PHYTOCHEMICALS<br>**Peace A Olajide** |
| 11:30 – 11:40 | Interactions. Q&A |
| 11:40 - 11:55 | Refreshment. Tea Break |

(11:55 – 13.25) **PARALLEL SESSION I** Location 1
Chairman: Dr **Olusesan Joshua** (SEEMS Ltd, Ikeja)
Rapporteur: Mr **Samuel Inuyomi** (OAU)

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|---|---|
| 11.55– 12:05 | CONVERGENCE OF HYPERTENSION, SALT AND GUT MICROBIOTA<br>**Darasimi Deborah Okunlola** |
| 12:05 – 12:15 | WILL NATURAL COMPOUNDS FILL THE CHEMOTHERAPEUTIC GAP IN THE MITIGATION OF CHAGAS DISEASE? A MECHANISTIC PERSPECTIVE AT ATOMISITC LEVEL<br>**Felix O. Okunlola** |

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| 12:15 – 12:25 | *MORINGA OLEIFERA* OIL MITIGATES NEUROBEHAVIOURAL DEFICITS AND CELLULAR ALTERATIONS IN THE PREFRONTAL CORTEX OF RATS EXPOSED TO PERMETHRIN.<br>**Sylvester J.O** |
| 12:25 - 12:35 | EFFECTS OF DIFFERENT FRACTIONS OF *Sarcocephalus latifolius* Bruce in RAT LIVER MITOCHONDRIAL MEMBRANE PERMEABILITY TRANSITION (mMPT) PORE *(IN VITRO)*<br>**Joan U. Imah-Harry** |
| 12:35 – 12:45 | Interactions. Questions & Answers |
| 12:45– 12:55 | INFLUENCE OF SOCIAL SKILLS TRAINING ON MODIFICATION OF HYPERKINETICf BEHAVIOUR IN PRIMARY SCHOOL PUPILS IN OSUN STATE, NIGERIA<br>**Ojo, Joanna Olusola** |
| 12:55 - 13:05 | ASSESSMENT OF PSYCHO-SOCIAL FACTORS INFLUENCING URBAN POLLUTION<br>**Tolulope Adebola Yamah** |
| 13:05 - 13:15 | ADSORPTION PROPERTIES OF POLYETHYLENE TEREPHTHALATE-BASED ADSORBENTS FOR THE REMOVAL OF POLYCYCLIC AROMATIC HYDROCARBON FROM DOMESTIC WATER SUPPLY<br>**Adeola Oluwaseyi Olaoye** |
| 13:15 – 13:25 | Interactions. Questions & Answers |
| 13:25 – 14:00 | LUNCH BREAK |

(11:55 – 13.25) **PARALLEL SESSION II** Location 1
Chairman: Pastor Udofia (NESREA SW Director)
Rapporteur: Tolulope Karokatose (University of Ilesa)

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| 14:00– 14:10 | DETERMINATION OF TRACE ELEMENTS CONCENTRATION IN SELECTED VEGETABLES FROM HIGH AND LOW CANCER PREVALENCE AREAS IN ONDO STATE, NIGERIA<br>**Peter T. Osuolale** |
| 14:10 – 14:20 | ASSESSMENT OF LEAD (Pb) AND ARSENIC (As) IN ALCOHOLIC BEVERAGES IN NIGERIA AND THEIR ASSOCIATED HEALTH RISKS<br>**Hammed Okegere** |
| 14:20 - 14:25 | THE IMPACT OF DEPRESSION FATIGUE AND ANXIETY ON SLEEP QUALITY OF STROKE SURVIVORS<br>**Goodness Odunayo Adefiwitan** |
| 14:25 – 14:30 | MICROBIAL LOADS IN FECES OF RABBITS (ORYCTOLAGUS CUNICULUS) FED BIOSLURRY DIET<br>**Ojo, Enoch Enibaletikogbo** |
| 14:30 – 14:40 | Interactions. Questions & Answers |
| 14:40– 14:47 | INVESTIGATING RADIOACTIVITY AND RADIONUCLIDES AROUND FACULTY OF SCIENCE (WHITEHOUSE), OBAFEMI AWOLOWO UNIVERSITY, ILE-IFE, NIGERIA<br>**Ajayi Samuel Ayodeji** |
| 14:47 – 14:54 | SIMULTANEOUS DETERMINATION OF TRACE ELEMENTS IN VEGETABLES FROM ONDO CITY USING PARTICLE-INDUCED X-RAY EMISSION TECHNIQUE<br>**Grace O. Akinlade** |

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| 14:54 – 15:00 | THE POTENTIALS OF ENVIRONMENTAL ACCOUNTING IN ACHIEVING SUSTAINABLE DEVELOPMENT<br>**Oluwakayode David Oke** |
| 15:00 – 15:10 | PHYSICO-CHEMICAL PROPERTIES OF HABITATS FOR ANOPHELES MOSQUITOES<br>**Fiyinfoluwa Ajetunmobi** |
| 15:10 – 15:20 | Interactions. Questions & Answers |
| 15:20 – 15:35 | Refreshment. Tea Break |

(11:55 – 13.25) **PARALLEL SESSION I** Location 2
Chairman: Dr Felix Okunlola (PCU)
Rapporteur: Bukola Olabode-Ayodele

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| 11.55– 12:05 | MICROBIAL ASSESSMENT OF INDIGENIOUS BRANDS OF PARACETAMOL AND CHLOROQUINE SYRUPS<br>**Eudora O Nwanaforo** |
| 12:05 – 12:15 | THE NEXUS BETWEEN CLICKTIVISM AND ENVIRONMENTAL HEALTH: DIGITIZING WASTE COLLECTION AND RECYCLING<br>**John Fatanmi** |
| 12:15 – 12:25 | PERCEIVED PROSPECTS OF RADIO AGRICULTURAL DRAMAS IN AGRICULTURAL INFORMATION DISSEMINATION BY SOME STAKEHOLDERS IN OYO STATE, NIGERIA<br>**Olajuyigbe O.A** |
| 12:25 - 12:35 | A REVIEW ON THE EFFECTS OF EXCLUSIVE AND PROLONGED BREASTFEEDING ON CHILDREN'S COGNITIVE DEVELOPMENT<br>**Karokatose Tolulope E.** |
| 12:35 – 12:45 | Interactions. Questions & Answers |
| 12:45– 12:55 | DIGITAL-BASED NUTRITION ASSISTANT SYSTEM FOR DIABETIC INPATIENTS<br>**Adamu Abdullahi Muhammed** |
| 12:55 - 13:05 | AN ASSESSMENT OF THE AEROSOL OPTICAL DEPTH AND ANGSTROM EXPONENT OVER ILORIN FOR AIR POLLUTION STUDY<br>**Michael Abimbola** |
| 13:05 - 13:15 | THE SPATIAL DISTRIBUTION OF GLOBAL RADIATION OVER SOME LOCATIONS IN SOUTH-WESTERN NIGERIA<br>**Bola F. Akinwale** |
| 13:15 – 13:25 | Interactions. Questions & Answers |
| 13:25 – 14:00 | LUNCH BREAK |

(11:55 – 13.25) **PARALLEL SESSION II** Location 2
Chairman: San (Dr) Tope Akinwunmi (President, EHOAN SW)
Rapporteur: Adedamola Agbelemoge (PCU)

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| 14:00 – 14:10 | SURVEY AND EVALUATION OF ELECTROMAGNETIC RADIATION LEVELS AROUND MOBILE AND TELECOMMUCATION MAST IN RESIDENTIAL AREAS IN SELECTED TOWNS OF OSUN STATE<br>**Lateef Bamidele** |
| 14:10 – 14:20 | INVESTIGATION OF BACKGROUND IONIZING RADIATION AT A GOLD MINE TURNED RESIDENTIAL AREA IN ILE-IFE |

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| | **Babalola D. O** |
| 14:20 - 14:25 | DETERMINATION OF $PM_{2.5}$ FROM SATELLITES-BASED AOD AND ITS APPLICATION IN EPIDEMIOLOGICAL STUDIES IN SOUTHWESTERN NIGERIA |
| | **Samuel Inuyomi** |
| 14:25 – 14:30 | HEAVY METAL POLLUTION IMPACT ASSESSMENT OF A RECLAIMED GOLD MINE TURNED RESIDENTIAL AREA AT MOKURO AREA, ILE-IFE |
| | **Olawolu O. O.** |
| 14:30 – 14:40 | Interactions. Questions & Answers |
| 14:40– 14:47 | ASSESSMENT OF NATURAL RADIOACTIVITY IN ENVIRONMENTAL SAMPLES (SOIL AND WATER) AND ASSOCIATION WITH CANCER PREVALENCE IN EKITI STATE, NIGERIA |
| | **Yemisi T. Alani** |
| 14:47 – 14:54 | EVALUATION OF THE THERAPEUTIC POTENTIALS OF NATURAL COMPOUNDS AGAINST *EIMERIA TENELLA* HEXOKINASE FOR POULTRY COCCIDIOSIS: BIOINFORMATICS AND *IN-SILICO* STUDY |
| | **Opeyemi O. Ojueromi** |
| 14:54 – 15:00 | INVESTIGATION OF BACKGROUND RADIATION IN SELECTED MARKET AREAS IN ILE-IFE AND MODAKEKE, OSUN STATE |
| | **Boluwatife Adeleke** |
| 15:00 – 15:05 | DEBTS AND FIRM PERFORMANCE OF LISTED CEMENT COMPANIES IN NIGERIA |
| | **John Tawiah Oladapo** |
| 15:05 – 15:10 | CANCER DISTRIBUTION PATTERNS OVER 5-YEAR PERIOD (2016-2020) IN EKITI STATE CANCER REGISTRY, IDO-EKITI, SOUTHWESTERN, NIGERIA |
| | **AB Arogundade** |
| 15:10 – 15:20 | Interactions. Questions & Answers |
| 15:20 – 15:30 | Refreshment. Tea Break |

(15:30 – 16:30) **PLENARY SESSION IV (CLOSING)**
Chairman: **Prof Joshua Ojo,** President LivingScience Foundation, Ile-Ife
Rapporteurs: **Dr. Dimeji Babatunde** and **Mrs Tosin Alani**

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| 15:30 – 15:40 | POSSIBILITIES OF RAPID ASSESSMENT OF NORM IN OIL RIG WASTE PRODUCTS FOR ENVIRONMENTAL COMPLIANCE MONITORING |
| | **G. O. Akinlade** |
| 15:40 – 15:50 | POLICY AND REGULATORY FRAMEWORKS FOR ADDRESSING E-WASTE AIR POLLUTION IN NIGERIA |
| | **Adeleke Ajani** |
| 15:50 – 16:00 | Interactions. Q&A |
| 16:00 - 16:20 | COMMUNIQUE AND CLOSING |

# PROFILES



Prof Julius K. Oloke,
Vice Chancellor, PCU

Professor Oloke was born in 17th December 1958. He obtained a PhD in Microbiology from Obafemi Awolowo University in 1989. He became a Professor of Microbiology and Biotechnology at Ladoke Akintola University of Technology in 1999.

Between 1993 and 1994 he did some genetic engineering work on an unusual isolate of *Bacillus thurigiensis* at the Biology Department University of Waterloo; Ontario Canada. As a result of this preliminary work, the organism was deposited at the American Culture Collection Centre (NRRL) as *Bacillus thurigiensis oloke* and filed for American Patent with ascension number WO/1997/041235.

The research group of Professor Oloke successfully constructed a Computerized Bioreactor and Computerized Temporary Immersion Bioreactor which are very vital in microbial fermentation and plant tissue culture. The Bioreactors were adjudged one of the ten outstanding research work at the First ever NUC Research Fair in Abuja. This feat contributed to fetching Ladoke Akintola University of Technology the First position among all the States Universities of Nigeria for three consecutive years. This research discovery has since been acquired by the National Biotechnology Development Agency; Abuja; Nigeria.

In a quest to find a long-lasting solution to immuno-compromised conditions, Professor Oloke formulated an immune modulating agent known as Trinity Immuno-booster (Trino IB). It was given a NAFDAC number in 2007 and has been successfully used for the management of different immuno-compromised conditions both in Nigeria and some other countries. As a result of this feat Professor Oloke was conferred with National Productivity Order of Merit Award by the Federal Government of Nigeria in August 2012.
In Ladoke Akintola University of Technology, Ogbomoso; he has served in different Administrative Posts like Head, Department of Pure and Applied Biology; Director, Academic Planning and Chairman, Pre-Degree Science Program.

Professor Oloke has served as a member of Governing Councils for Ladoke Akintola University of Technology and at The Nigerian Baptist Theology Seminary, Ogbomoso, Nigeria
He has graduated more than twenty Doctoral students some of which have become Professors.
Professor Oloke who has served as a member of NUC Accreditation Panels to three Universities and had been a Visiting Professor to University of Lagos and Osun State University.

Among his international travels, in May 2014, Professor Oloke was specially invited to All Saints University College of Medicine in St Vincent and Grenadines as a Foundation Dean for the Faculty of Science. During his stay in All Saints University he played a major role in the accreditation excise of the University and assisted the University in setting up a Research Committee.

He has been the Chairman LAUTECH Christian Community since 1991 till date. He was the Ogbomoso Baptist Conference Representative at National Executive of Nigerian Baptist Convention for eight years.
In August 2018 Professor J K Oloke was appointed as the Pioneer Vice Chancellor of Precious Cornerstone University Ibadan. He has been able to bring on board his wealth of experience to build a university with strong entrepreneurship drive empowering students to be employer of labor. The first set of students graduated in a Convocation Ceremony that was held in November 2022.

At the advent of COVID-19, Professor Oloke led other scientists to develop two COVID-19 vaccines. The vaccines are at the stage of animal trials.

Professor Oloke is a Certified Health and Wellness Coach by the American College of Lifestyle Medicine. He is also a Certified Behavioral Coach by Precision Nutrition.

He is married with children.

**Emeritus Prof A.F. Oluwole**



Doyen of Environment-Health studies in Nigeria**,** Prof A.F. Oluwole was born in September 1939 at Ijare, Ondo State. He joined the services of the then University of Ife (now Obafemi Awolowo University), Ile-Ife in 1969 as a Lecturer I and rose to become a Professor in 1978. Between 1975 and 1976 he served as the acting Head, Department of Physics, after which he became the Coordinator of the University's Nuclear Technology Programme (1976 – 1980). The Programme gave birth to the Centre for Energy Research and Development (CERD), where Prof Oluwole served as the pioneering Director (1980 to 1983). Prof Oluwole not only raised the profile of research on the Nigerian environment by attracting several multi-million dollars international fundings for pioneering original research, he also spearheaded the introduction of the Health Physics and Environment option into the postgraduate programmes at the Obafemi Awolowo University, Ile-Ife.

Outside the Obafemi Awolowo University, Prof A.F. Oluwole held various teaching and research positions at several academic institutions including the University of California, Berkeley, (1964/65, 1969), University of Heidelberg FRG (1971), University of Sussex (1970), University of Washington, Seattle, (1972), Columbia University (1974), McMaster University, (1977).Federal University of Technology, Akure, (1984/85), Nuclear Research Center, Washington State University, Pullman (1985, 1991), University of Surrey, (1989, 1990, 1992, 1993, 1994) and University of Stuttgart, FRG (1989, 1990, 1992, 1993, 1994).

Apart from teaching and research, the meritorious services of Prof A.F. Oluwole include membership of**:** Federal Panel on Ionising Radiation (1970 to 1990); Natural Sciences Research Council Committee on the National Institute of Nuclear Sciences (1975); FMST's Review Panel on National Policy on Science and Technology (1983). National Panel on Integrated Energy Policy for Nigeria by Ministry of petroleum and Energy 1984, Energy Panel on National Nuclear Centre and Science village, Abuja by FMST, 1987., Energy Commission of Nigeria (2001). Prof Oluwole was also a member of the International Atomic Energy Agency (IAEA) Committee on Nuclear Information Services (1982), and Nuclear Data (1993).

Prof Oluwole was inducted a fellow of the Nigerian Institute of Physics in 1996. He is a member of several professional bodies, including the Tau beta Pi-American National Honour Engineering Society (1964), American Physical Society (1968), American Association of Physics Teachers (1968), Science Association of Nigeria (1970), West African Science Association (1970), Nigeria Institute of Physics (1974), New York Academy of Sciences (1980), and the American Nuclear Society (1982), American Association for the Advancement of Science (1996).

He has authored over eighty scholarly articles in reputable local and international journals in addition to several important books and Monographs

An accomplished scholar, Prof Oluwole was awarded the Nigerian National Order of Merit (NNOM) for Science in 2004. Among over a dozen other prestigious awards received by Prof A.F. Oluwole are the Doctor of Science *(Honoraris Causa)* from the Federal University of Technology, Akure (2006) and the Adekunle Ajasin University, Akungba, Ondo State (2008). In 2019, Prof A.F. Oluwole was appointed Emeritus Professor at the Obafemi Awolowo University, Ile-Ife.

# Steering/Organizing Committee Members



**Adeniyi Samuel Oginni**; **MBChB; MPH (Comm. Med); Ph.D (Ecology & Env. Science); Cert. MM4H (Edinburgh)**

Dr. Adeniyi Samuel Oginni is a public health physician, environmentalist, human rights activist, university lecturer and civil servant. He graduated from Obafemi Awolowo University, Ile-Ife Nigeria as a medical doctor in 1989, bagged a Master of Public Health (Community Medicine) degree at the University of Ibadan through a World Health Organisation (WHO) fellowship programme in 2006 and obtained his Ph.D in Ecology and Environmental Science from the Institute of Ecology and Environmental Studies of Obafemi Awolowo University, Ile-Ife, Nigeria in 2017. He completed a certificate course in Managing Markets for Health (MM4H) of the University of Edinburgh supported by the World Bank Group in 2020.

He is a fellow of the Nigeria Institute of Management (Chartered) and the only Nigerian admitted into the 2016 cohort of Emerging Leaders of the World Heart Federation (WHF). He was the pioneer Executive Secretary of the Osun Health Insurance Agency and the Chairman of the Forum of Chief Executive Officers of State Social Health Insurance Agencies established to accelerate the movement towards achieving Universal Health Coverage (UHC) in Nigeria. Currently he is the Executive Secretary/CEO of the Osun State Agency for the Control of HIV/AIDS (O'SACA). His research interest is workplace safety, health financing, health policy and management. His doctoral thesis assessed the health of metal smelters in a fast growing factory and he was in the collaborative research that assessed compliance of hospitality facilities in Kampala with the 100% smoke-free law of the government of Uganda.

Dr. Oginni is the Scientific Officer for Nigerian Heart Foundation (NHF), a member of the NCD Alliance Nigeria Research Working Group and an active member of the Nigerian Joint Learning Network for UHC. He is the president of Christian Initiative for Nation Building (CINB) an NGO with health promotion and disease prevention, good governance, poverty reduction and human rights advocacy as its thematic areas. He is a past chairman of the Osun state chapter of Nigerian Medical Association. He currently sits on the boards of a number of NGOs including the Network of Non-Governmental Organisations (NETNOS), the Christian Leaders Assembly in Yorubaland (YCLA), and Community Building Development Initiative (CBDI) in Osun state, Nigeria.

Dr. Oginni was appointed as NCD Alliance Nigeria Country Focal Point for the 2020 Global week for Action on NCDs with the theme "Accountability". In recognition of the activities carried out during the week, NCD Alliance Nigeria won the 'Act on NCDs Campaign Fuel Awards' of the Global NCD Alliance. He is a winner of many awards for meritorious service to humanity and in the civil service of Osun State, Nigeria where he currently works. Dr Oginni is Secretary to the Steering Committee and a member of the Organizing Committee.



**Oluwatoyin Ikuteyijo** is a doctoral student of Society, Gender and Health unit in Department of Epidemiology and Public Health, Swiss Tropical and Public Health Institute, University of Basel Switzerland. Her research interests are in violence against girls and women, Adolescents Sexual Health, Child Health and Environmental Health. She is well experienced in quantitative and quantitative research. Olutoyin was a McCune visiting scholar in Mixed Methods Program, Department of Family Medicine University of Michigan 2019. She is currently a committee member of IUSSP Panel on Early Career Perspective (ECP) (2022-2024) She is on the Board of Advisers of the LivingScience Foundation.



**Ismail Adeleke Ajani** was born on the 4th of January, 1960 in Osogbo, Osun State to the family of Alhaji and Madam R. A. Ajani. He had his elementary School education at St. Michael Primary Iyin-Ekiti and John Mackay Primary School Osogbo; while he had his Secondary Education at Doherty Memorial Grammar School Ijero- Ekiti and Ado Grammar School. He further went through Higher School Education at Ondo High School in Ondo State, He gained admission to University of Ife (now Obafemi Awolowo University (OAU) Ile-Ife to study Agriculture (Plant Science) in 1981. Mr. Ajani bagged the Bachelor of Agriculture (B.Agric.) in 1985 and did his NYSC Primary Assignment at Nigerian Agricultural and Cooperative Bank Owerri, Imo State. In his quest for academic excellence, Mr. Ajani bagged Master of Science (M.Sc.) Agriculture in 1992 from University of Ibadan, Ibadan.

Mr. Ajani was among the Pioneer Staff of the National Environmental Standards and Regulations Enforcement Agency (NESREA) in 2007. Between 2008 and 2015, he served as the Ekiti State Coordinator, and became the Zonal Director, Southwest Zone of NESREA from July 2015 from which position he retired in 2020. Mr Adeleke Ajani has attended several International Conferences and Trainings both within and outside the country on Environment with interest and vast experience in Compliance Monitoring and Enforcement, Industrial Ecology, Forest Resource Management, Biodiversity Conservation and Management, Environmental Planning and so on. Mr. Ajani is a devout Muslim happily married to Mrs. Bosede Ajani his best half and mother of his lovely children.



**Tope Akinwumi** *fwapceh* (DPH, B.SC (H\E),MEM, M.Sc, PhD) is a Public and Environmental Health expert, a registered Environmental Health Officer with Environmental Health Officers Registration Council of Nigeria (EHORECON). He currently serves as the President of Environmental Health Officers Association of Nigeria in the South West.

Dr Akinwumi has served in various capacity including Head of Division , Health Education and Community Mobilization, and as Water Supply Officer in Egbedore L. G in Osun State where he made a tremendous achievements in the areas of borehole drilling and supervision ,rehabilitation of HPBH, MBH, Hand washing.

Dr Akinwumi is currently the Head of Department, Water and Environmental sanitation Olorunda L.G , Igbona- Osogbo, Osun State where he is in charge of supervision of water and waste management activities at the centre of Osogbo (Osun State capital) potable water supply and quality control, market sanitation, flood control activities,

food hygiene, environmental impact assessment, pollution control, excreta and sewage management, sanitary inspection of premises, pest & vector control and other environmental health activities.

He is the leader/coordinator of a popular weekly radio programme on Osun State Broadcasting Cooperation Ile- Awiye Oke - Bale Osogbo, tagged **"Imototo Ayika Wa"** meaning Environmental Sanitation where the public is educated / enlightened on the components of Environmental Health to improved quality of life, survival, promote hygienic condition and welfare and sustainable environment .

Dr Akinwumi is a part- time lecturer at Environmental Health Officers Registration Council of Nigeria (EHOREON} training centre, Ilesa and chief examiner to the Council certification examination in Nigeria with a good track record.

Dr Akinwumi was inducted as fellow of West African Postgraduate College of Environmental Health in 2015 and Fellow of Nehemiah Fellows, Diocese of Osun Anglican communion. He is a member of several professional and social bodies where he has been decorated with awards and recognitions He has attended several conferences, training and workshops home and abroad on issues relating to water quality assurance, waste management, climate change, health education, pollution control dispute management e.t.c and presented many technical papers in various conferences, meetings and workshops. He is happily married and blessed with children.



**Oluropo F. DAIRO** BSc, MSc, Electronic and Electrical Engineering, Ph.D Physics
Since October 2010, Dr Dairo joined the Department of Physical Sciences in Redeemer's University as an Assistant Lecturer. His research visits traversed the International Satellite Beacon symposium at Abdus Salam International Centre for Theoretical Physics (ICTP, Italy), Quantum, Atomic, Molecular and Plasma Physics (QuAMP) at Durham/Newcastle University, UK, courtesy of Institute of Physics (IOP), UK and Gaseous Electronic Conferences at North Carolina State University, USA courtesy of American Physical Society. Prior to the appointment he was with *Société Internationale de Télécommunications Aéronautiques* (SITA) where he started as an intern in 2002 and was welcomed back to top-flight service as a Field Service Engineer after his studies in the UK in 2009.

While in the UK, he obtained PgD Communication Engineering and MSc Electronic Instrumentation Systems in 2006 and 2007, respectively from the University of Manchester. Among the opportunities enjoyed while in the UK are: communication support staff of the Alumni Relation and Development Unit of the University of Manchester (UK and North America campaign, 2006-2007), EDEXCEL Specialist Marker (Systems and Control, 2006-2008), NIST short course on Laser measurement (US Department of Commerce, Boulder, Colorado, 2007) and member of staff Creative Support Ltd (2007-2009). Dr Dairo is an alumnus of the Obafemi Awolowo University with BSc (Hons) in Electronic and Electrical Engineering. He is an active member of Institute of Electrical and Electronic Engineers (IEEE), Optical Society of America (OSA), Society of Satellite Professionals International (SSPI), American Physical Society (APS), Institute of Physics (IOP) and Nigerian Union of Radio Science (NURS). His specific research interests include: Radio communication and environmental monitoring; Molecular effect of green house gases on radio communication; Atmospheric transmission at microwaves frequency; and Nano-Photonics and sensing applications.



**Joshua Ojo** is a Professor of Health Physics and Environment at the Department of Physics and Engineering Physics, Obafemi Awolowo University,(OAU) Ile-Ife, Nigeria. He is currently on Leave at the Precious Cornerstone University, Ibadan, as Dean Designate of her upcoming School of Postgraduate Studies.

Prof Ojo obtained his PhD in Engineering Physics from the OAU in 1995, and served as Head of Department at his *alma mater* between 2011-2015. He acquired broad research experience from top laboratories in several parts of the world including Britain, the United States, Czech Republic, Poland, and Italy. He has published over 60 articles in local and international peer-reviewed journals. Provoked by results he obtained as Principal Investigator in a series of Research Contracts carried out under the auspices of the International Atomic Energy Agency (IAEA), Vienna between 2001 and 2014, Prof Ojo decided to form a non-governmental organization that would conduct research into environment-health issues of peculiar relevance to Nigeria, communicate the findings widely in the country, and advocate for possible mitigating actions at the appropriate levels. The LivingScience Foundation was consequently registered with the Corporate Affairs Commission in October 2016. Prof Ojo's broad research interest is in assessment of risks associated with exposure to environmental hazards by various population subgroups. His works include both measurements and modelling of exposure to the hazards. He is particularly interested in toxic and essential elements, pesticides, tropospheric ozone, microwave radiation associated with GSM communication, and environmental radioactivity. He is happily married to Olusola and they are blessed with grown-up children.



Grace Olubunmi Akinlade is a Lecturer in the Department of Physics and Engineering Physics at the Obafemi Awolowo University, Ile- Ife. There, she also serves as Coordinator of the EnvironLab, a Research/public service Laboratory with full accreditation from the Department of Petroleum Resources. Dr Akinlade had her first and second degrees in Meteorology and Atmospheric Physics respectively. Her Ph.D (Engineering Physics) was obtained in the field of Health Physics and Environment. Her research focus is presently in toxic metals and environmental radioactivity. Dr Akinlade had research stints in Germany and Portugal and has participated in several learned Conferences at home and abroad, including the prestigious Women in Physics Conference held in Seoul, Korea in 2008. Grace is happily married with children.

Mrs. Karokatose Tolulope E. holds a B.Sc (Ed) Physics and Masters degree in Engineering Physics (Health Physics and Environment option) both from the Obafemi Awolowo University, Ile-Ife. Her research is on modelling the transfer of lead into the tissues of women with major emphasis on how much gets to infants through breastfeeding. She currently lectures in the department of Physics, State College of Education, Ilesa. She has a keen interest in welfare of infants. She is a member of the Management Committee of the LivingScience Foundation.

**Wada Aliyu**

**Wada Aliyu** is a Chief Health Records Officer at the Department of Health Information Management, National Hospital, Abuja - Nigeria. He obtained a Higher National Diploma (HND) in Health Information and Biostatistics from A.B.U, Teaching Hospital, Zaria, and a BSc in Health Information Management (HIM).



He proceeded to the premier University (University of Ibadan) in 2012 where he obtained a Master's Degree in Health Information Management (HIM). He is currently a Research Fellow with Babcock University Ilisha Remo, where he is undergoing a Doctorate Degree (PhD) in Information Resources Management with specialization in Health Information Management.

**Wada Aliyu** is a member of several professional bodies among which are Association of Health Records and Information Management Practitioners of Nigeria (AHRIMPN), American Health Information Management Association (AHIMA), International Federation of Health Information Management Associations (IFHIMA) and the Institute of Management Consultants – Nigeria (IMC). As a result of the display of high degree of Management skills and professionalism in his chosen career, and satisfying the protocols of the Institutes he belongs, he earned the Fellowship of Health Records and Information Management (FHRI) in 2018 and Fellowship of the Institute of Management Consultants (FIMC) in 2019. In same year 2019, he became Chattered Management Consultant (CMC) after satisfying the requirements of the Institute of Management Consultant.

His work experience covers areas of Data Management and Analytics, Classification of Disease entities and Clinical Coding based on WHO published criteria, Patient Experience Management, Business Development and Management Consultancy.

## FULL LIST OF MEMBERS OF THE LOCAL ORGANIZING COMMITTEE 8TH NCEH

| | | |
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| **Adeleke AJANI** M.Sc<br>adeleke_ajani@yahoo.com<br>Retired Director, National Environmental Standards and Regulation Enforcement Agency, [NESREA]. | **Grace AKINLADE** Ph.D<br>gakinlade@oauife.edu.ng<br>Lecturer. Department of Physics and Engineering Physics, Obafemi Awolowo University, Ile-Ife | Bola AKINWALE Ph.D<br>jibolakinwale@yahoo.co.uk<br>Chief Lecturer, Department of Physics, Adeyemi College of Education, Ondo |
| **San Tope AKINWUMI** Ph.D<br>itakinwumi2011@gmail.com<br>South West President, Environmental Health Officers Association of Nigeria, [EHOAN]. | **Wada ALIYU** M.Sc<br>Wadaaliyu5015@gmail.com<br>National Secretary, Association of Health Records and Information Management Practitioners of Nigeria (AHRIMPN), Abuja | **Toyin AMUSAN**, M.Sc<br>amusanob@gmail.com<br>Director/Head, Health Information Management Department, Obafemi Awolowo University Teaching Hospital Complex, Ile-Ife. |
| **Samson AWOYODE**<br>NESREA, Osun Field Office, Osogbo | **John AYOOLA** PhD, FCA, CISA<br>Alabiayoolaaca@yahoo.com | **Dimeji BABATUNDE** Ph.D<br>oae.babatunde@gmail.com |

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| | Senior Lecturer, Department of Management and Accounting, OAU, Ile-Ife | HOD, Department of Physics, Mountain Top University, Ogun State |
| **Ropo DAIRO** Ph.D<br>dairof@run.edu.ng<br>Senior Lecturer, Faculty of Engineering, Redeemer's University, Ede | **Toyin IKUTEYIJO** M.Sc<br>ikuteyijotoyin@gmail.com<br>Ph.D Fellow, Swiss Tropical and Public Health Institute, University of Basel, Switzerland. | Nnamdi **JIBIRI**, Ph.D<br>jibirinn@yahoo.com<br>Professor and Head, Department of Physics, University of Ibadan, Ibadan |
| **Tolu KAROKATOSE** M.Sc<br>tolu_karo@yahoo.com<br>Lecturer, University of Ilesa, Ilesa, Osun State | **Shukwunweizu MAIKE** M.Sc.<br>Shukwunweizu.maike@nesrea.gov.ng<br>Osun State Coordinator, National Environmental Standards and Regulations Enforcement Agency, Osogbo | **Isijaan NKANTA** B.Tech,<br>adasiscience@gmail.com<br>Principal Scientific Officer, National Environmental Standards and Regulations Enforcement Agency, Abuja |
| **Adeniyi S. OGINNI**<br>MBChB, MPH, Ph.D, Cert. MM4H<br>adeniyioginni02@gmail.com<br>Executive Secretary, Osun Health Insurance Agency, Osogbo | **Joshua OJO** Ph.D<br>(jojo@oauife.edu.ng)<br>Professor of Health Physics and Environment, Obafemi Awolowo University, Ile-Ife | **Oyedele OKETAYO** Ph.D<br>oketayodele@gmail.com<br>Professor, Department of Physics,<br>Federal University, Oye-Ekiti |
| **Felix OKUNLOLA Ph.D**<br>Felixokunlola@pcu.edu.ng<br>Sub Dean, Faculty of Pure and Applied Sciences, Precious Cornerstone University, Ibadan | **Sanitarian Femi OLA**<br>Olufemiola260@gmail.com<br>President, Environmental Health Officers Association of Nigeria, Osun State | **Modupe SANYAOLU (Ph.D)**<br>sanyaolum@run.edu.ng<br>Lecturer, Department of Physical Sciences, Redeemer's University, Ede |
| **Elijah UDOFIA** M.Sc.<br>swzone@nesrea.gov.ng<br>Director, National Environmental Standards and Regulations Enforcement Agency, (NESREA) SW Zone, Ibadan. | | |

# INVITED SPEAKERS

## PROFESSOR AMOS FATOKUN

Professor Amos Fatokun is Professor of Pharmacology and Neuroscience, currently based at the School of Pharmacy and Biomolecular Sciences, Liverpool John Moores University (LJMU), Liverpool, UK, where he leads a research team focused on elucidating the cellular and molecular mechanisms underpinning diseases such as cancers and neurodegenerative conditions, and using the knowledge gained to develop novel, disease-modifying therapeutics. He explores the potential of synthetic compounds and natural products to serve as leads for drug development. He works within LJMU's world-class Centre for Natural Products Discovery (CNPD).



Professor Fatokun obtained a Bachelor of Pharmacy (with Distinction) from the Obafemi Awolowo University, Nigeria, in 2000, and an award-winning PhD from the University of Glasgow in the UK in 2006. He achieved an exceptional feat of passing his PhD without any corrections required to the thesis by the examiners, and the work was subsequently recognised by the British Neuroscience Association (BNA) as the second-best PhD (close second) in neuroscience in the UK in 2006.

Following his PhD, he was awarded, in unbroken succession, four competitive international postdoctoral research fellowships, each obtained at first attempt. Through the American Heart Association (AHA) Postdoctoral Fellowship, he worked on a drug discovery project at the Johns Hopkins School of Medicine in the US, after which he visited the University of Sydney in Australia through the award of an International Visiting Research Fellowship (IVRF). He then returned to the UK, following the awards of an EU Marie Curie Fellowship and the Nottingham Advanced Research Fellowship (NARF), through which he worked at the University of Nottingham. He took up a lectureship at the University of Bradford in 2013, before moving to Liverpool John Moores University in 2016.

Professor Fatokun has contributed significantly to the understanding of neuronal signalling by the CNS neurotransmitter glutamate, which binds to glutamate receptors, and how overactivation of the receptors by excessive levels of glutamate (especially overactivation of the NMDA receptor), can lead to neuronal injury and ultimately neuronal death through mechanisms that include oxidative stress, nitrosative stress and inflammation. In the area of cancer research, his work on cancers associated with inherited harmful mutations in the *BRCA1* and *BRCA2* genes has identified a number of natural compounds that could induce the death of such cancer cells through inhibition by those compounds of a protein that helps to repair single-strand DNA damage, named PARP (poly (ADP-ribose) polymerase). The use of such PARP inhibitors is an example of targeted cancer therapies, which have significant advantages over standard chemotherapy, as they are more selective (more precise) against cancer cells. Part of his recent and on-going work has identified the crosstalk between PARP and the aryl hydrocarbon receptor (AhR) that mediates the toxic effects of environmental pollutants such as the dioxins, which have been linked to the development of cancer.

Professor Fatokun has secured grant and fellowship funding in excess of £1 million and authored several peer-reviewed articles in leading journals, as well as conference abstracts and book chapters. He has supervised and mentored many PhD students, postdoctoral fellows, and visiting researchers, including from Nigeria. He has contributed significantly to the development of pharmacology, cell biology and natural products research and education in Nigeria. He collaborates with several groups across the world and has been an external examiner of PhD and MPhil theses. He is a manuscript reviewer for several leading journals and a grant reviewer for UK and international funders. He has been an invited speaker as several conferences and workshops and has also been involved in organising international conferences.

Over the course of his career Professor Fatokun has obtained several prestigious awards for the quality of his research and the excellence of his conference presentations, such as the Pfizer Prize, the Alzheimer's Drug Discovery Foundation (ADDF) Young Investigator Scholarship, and the British Pharmacological Society's Schachter Award. He is a Fellow of both the Royal Society of Chemistry (FRSC) and the British Pharmacological Society (FBPhS), as well as an Ambassador and member of the Meetings Committee of the British Pharmacological Society (BPS). He is also a Consultant to the British Council (UK), through which role he has facilitated academic workshops in many countries, including Brazil, China, Kazakhstan, Thailand, Indonesia and Ghana.

In addition to scientific research, he is keenly interested in how science can be used to influence policymaking and how entrepreneurship can be better embedded into the academic curricula of medical, pharmacy, pharmacology, biomedical and other health-related programmes (courses). He leads significantly funded projects in these domains.

https://www.ljmu.ac.uk/about-us/staff-profiles/faculty-of-science/pharmacy-and-biomolecular-sciences/amos-fatokun

## PROFILE: DR. SUNDAY ADELEKE OJEWALE



Dr. Sunday Adeleke Ojewale is one of the foremost Environmental-Health professonals in Nigeria. He was a foundation Council member of Environmental Health Officers Registration Council of Nigeria (**EHORECON**) for two terms of 3 years tenure. He also was the foundation and immediate-past Secretary General (**SG**) for The West African Postgraduate College of Environmental Health (**WAPCEH**).

Dr Ojewale holds the Royal Society (RSH) London Diploma in Environmental Health (1975); Environmental Health Officers Tutors Diploma, Ibadan (1980 – 1981); Diploma in Health Administration & Management, GIMPA GHANA, (1991); BSc. Health Education. University of Nigeria (UNN), Nsukka (1997); M.Sc. Environmental Health Management, University of Ado-Ekiti (UNAD), Ado-Ekiti (2002) and Ph.D. Public Health London (2013).

He was a field Environmental Health Officer in many town and cities in the Old Western State of Nigeria between 1975 – 1980, and a Senior Environmental Health Tutor at the College of Health

Science and Technology. Ilesa, Osun State between1981 – 1989. Between 1989-2007 Dr Ojewale taught at the Federal Training Centre for Teachers of Health Sciences, University College Hospital, Ibadan where he retired as Director of Training in 2009 having had an extended Service granted by the then Chief Medical Director – Prof. Abiodun Ilesanmi.

At various periods, Dr. Ojewale was visiting lecturer at the University of Ado-Ekiti, Ado-Ekiti (**UNAD**), Lead City University, Ibadan, and Kwara State University Malete Ilorin (**KWASU**). He is currently an adjunct lecturer in the Department of Environmental Health Sciences, University of Ibadan (**UI**), Ibadan, as well as an Examiner for Environmental Health Officers Registration Council of Nigeria (**EHORECON**) and the West African Health Examination Board (**WAHEB**).

Dr. Ojewale had organized and presented papers at Seminars, Workshops, Symposia, in and outside Nigeria and he is currently on a Textbook on Solid Waste Management. He had also participated in Research works with Professors MKC Sridhar (Mushroom), Professor Oladimeji Oladepo (Facial Marks and HIV/AIDS) and Professor Bosun Arinola (Schistosomiasis in Adolescents: A Case Study in Gege, Ibadan, Oyo State Nigeria). He is a Public Health/ Environmental Health Consultant for Ogun, Oyo, Lagos State Local Government Service Commission and for Rural and Water Sanitation (**RUWATSAN**) in Osun State.

Dr. S.A Ojewale is happily married with Children.

**PROFESSOR OLUGBOYEGA OYERANTI**



Olugboyega Alabi Oyeranti is the Dean, Faculty of Social and Management Sciences, Precious Cornerstone University, Ibadan, Oyo State. He graduated with a First Class Degree and won the Vice-Chancellor's Prize for the Best All-Round Final Year Student Academic Performance at the Usmanu Danfodiyo University, Sokoto in 1990. He obtained his postgraduate degrees in Economics at the University of Ibadan, Ibadan.

Prof Oyeranti was a lecturer in the Department of Economics at the Bayero University, Kano between 1991 and 1997 before transferring his services to the University of Ibadan, Ibadan in October, 1997. He is a Life Member of the Nigerian Economic Society (NES), member of African Economic Research Consortium Network based in Nairobi, Kenya, and a resource person/facilitator in The Partnership for African Social and Governance Research (PASGR) based in Nairobi, Kenya.

He has a wide range of consulting experiences for international and national organisations as well as different levels of government in Nigeria. He has consulted for organisations such as The World Bank, United Nations Industrial Development Organization (UNIDO), United Nations Development Programme (UNDP), Department of International Development (DFID), Adam Smith International, The Economic Community of West African States (ECOWAS), National Planning Commission, Abuja, Federal Ministry of Finance Abuja, the Federal Ministry of Health, Abuja, the Osun State Government, and the Oyo State Government. Prof Oyeranti was the Lead Assessor in Imo State during the 2006 SEEDS Benchmarking Exercise.

His teaching and research areas include macroeconomics, microeconomics, development economics, environmental economics, and public sector economics. He has scholarly publications in these economics field areas.



ALHAJI BABAGANA MUSTAPHA was born on 5th July 1967, in Bama Local Government Area of Borno State to a humble and dedicated Muslim family whose father was a farmer and renowned Islamic scholar of repute. Alhaji Babagana Mustapha (proudly Kanuri) had his early education at the Old Bama Primary School, in Bama Local Government Area of Borno State, where his leadership strides were noticed by his teachers as his brilliance and coordination of his classmates left no one in doubt that he was destined for greater heights. Upon a heroic graduation from primary school armed with first school leaving certificate 1979, admission into secondary school was a mere formality as he enrolled into Form1 in 1980 where he left with a West African School Certificate in 1985. Thereafter, he proceeded to the Borno College of Basic Studies (BOCOBS) between 1986 and 1988.

He got employed with the University of Maiduguri Teaching Hospital as a clerical officer in the Medical Records Department in 1991 – 1994. Consequently, he studied for and obtained his National Diploma (ND) in Health Records Management and Biostatistics at the University of Maiduguri Teaching Hospital, Borno State between 1994-1996, and the Higher National Diploma (HND) in same field from same institution between 1996 -1998. Thereafter he served his mandatory one year National Youth Service Corps (NYSC) between 1999-2000 at the State Specialist Hospital, Abeokuta, Ogun State.

Aside being a professional in Health Records Management, Babagana Mustapha's crave for versatility, got him enrolling into the famous MBH Computer, Maiduguri, Borno State where he bagged a diploma programme in Computer Application and Internet in 2002. Desiring excellence and more academic qualifications, he went for a Post graduate Diploma in Education (PGDE), University of Maiduguri, (2008) earning him leadership/teaching skills which made him an all-rounder in his interface with people. From there, just like the man Midas with the golden touch in fairy tales, he transferred his services from University of Maiduguri Teaching Hospital to the Health Records Officers Registration Board of Nigeria in 2019. He further proceeded to obtain an MSc degree in Health Information Management from the prestigious Maryam Abatcha American University of Niger (MAUN), Maradi, Republic of Niger, (2019-2021).

Alhaji Mustapha is currently the second substantive Registrar/CEO of Health Records Officers Registration Board of Nigeria after the retirement of the first substantive Registrar/CEO, Alhaji Mohammed Ibrahim Mami on completion of his tenure on the 13th July 2021. His journey to the peak spawned over the years from being a clerical officer, department of Records, UMTH, (1991-1994), Head of Outpatient, PHRO, Department of Health Records, University of Maiduguri Teaching Hospital, (2002 -2003), Tutor/Students Affair Officer, School of Health Information Management, UMTH, (2003-2010), Chief Health Records Officer, Coordinator ,School of Health Information Management UMTH, (2011-2015), Chief Health Records Officer, Head, Department of Health Records, University of Maiduguri Teaching Hospital,Maiduguri, (2017-2019), Assistant Director, Health Records Management, Head, Professional Matters, Health Records Officers Registration Board of Nigeria, (2019-2021) and Deputy Director, Health Records Management, Head, Professional Matters, Health Records Officers Registration Board of Nigeria (2021) before assumption of office as the Registrar/CEO .

Babagana Mustapha is happily married with children.

**John Fatanmi**



According to Business Day Newspaper, John Fatanmi (fondly called JGold), a Media Environmental Clicktivist and Tech. Enthusiast, is using his interests in Media, the Environment and Tech., to change Africa's Environmental Sustainability and Circular Economy narratives.

He is the Founder of City Scope Africa (www.cityscopeafrica.com) and the Visionary of the annual African Business Professionals and Entrepreneurs Conference/Awards (AfPEC) in Lagos-Nigeria.

He is also the Public Relations Officer, (in charge of PR and Media) for Waste Management Society of Nigeria, WAMASON (Lagos Council).

John is redefining the green and brown environment with his brainchild, Media Environmental Clicktivism, in an innovative and creative manner that Youths can relate to and also engage to be part of Nigeria and Africa's sustainable development agenda.

Prof Rachel Obed



Prof. Rachel I. Obed is currently a Professor at the Department of Physics, University of Ibadan, Ibadan, Nigeria. Although, her area of specialization is Radiation and Health Physics, she is also involved in Medical Physics training and research. Her areas of research include imaging techniques and patient dosimetry in diagnostic and therapeutic radiological procedures. She has about 25 years of expertise in radiation protection and dosimetry for patients undergoing medical procedures. Her research work involves the estimation of radiation dose from medical exposures in order to generate reliable dosimetry data for use in epidemiological studies of ionizing radiation and cancer risk.

In 2010, Prof. Obed was awarded with the prestigious Taqi Binesh award at the international College on Medical Physics, for her significant contribution to Medical Physics research under the Training and Research in Italian Laboratory (TRIL) program at the Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy. She was the Best TRIL research fellow for the past 5 years in 2010.

Prof. Rachel Obed was an IAEA fellow at National Physical Laboratory UK (Sept – Dec, 2001), a Junior Associate of ICTP (2005 – 2012), a Regular Associate of ICTP (2014 – 2019). She is currently a member of the Organization for Women in Science for the Developing World (OWSDW), a member of the Nigeria Institute of Physics (NIP) and also a member of the Nigerian Association of Medical Physicists (NAMP).

Prof. Obed teaches and supervises both undergraduate and post-graduate students in Physics. She has successfully supervised quite a number of Ph.Ds, Masters and Bachelors students, some of whom are currently working as Lecturers and Medical Physicists in both private and government institutions, locally and internationally. Prof. Obed is also currently a Nigerian Nuclear Regulatory Authority (NNRA) accredited Radiation Safety Consultant/Adviser.



## 2023 WINNER, A.F. OLUWOLE PRIZE – **ENGR OLUFUNBI O. O.SODE**

Engineer Olufunbi Oludotun Olanrewaju SODE was born in Lagos on 16th July, 1955. He attended Remo Secondary School, Sagamu, Remo between 1968 and 1973, and the University Tutorial College, London between 1976-1977. Thereafter, he proceeded to the Polytechnic (now The University), Queensgate, Huddersfield where he obtained a Higher National Diploma in Chemical Engineering in 1979, and also the University of Bradford, Bradford, West Yorkshire between 1979 and 1982. He was awarded a Post Graduate Diploma in Powder Technology in 1981, and a degree of Master of Philosophy in the same speciality in 1985. He is a registered member of the Council for the Regulation of Engineering in Nigeria (COREN), Institution of Chemical. Engineers, Rugby, England, and the Nigerian Environmental Society.

Between July 1982 and June 1983, Engr Sode did his mandatory NYSC service at the NNPC Chiyoda, Kaduna and later at the Chemical Engineering Department of the Ahmadu Bello University, Samaru, Zaria. There, he participated in developing the proposal for a cooperation program between that Department and the National Roots Crops Research Institute, Umuahia on Ginger Processing.

A Christian and married, Engr. Sode started his career in the Civil Service with the Lagos State Teaching Service Commission. Between 1984-1991 he served as HOD Mathematics and Technical Department within the Commission. He was also involved in Curriculum development.

In 1991, he transferred his service to the Federal Environmental Protection Agency, FEPA and was assigned the responsibility of the Head, Public Complaint Unit of the Agency. As a result of his passion, commitment and dedication to duty, he was posted to the Port Harcourt Office of FEPA in 1993 until the establishment of the Federal Ministry of Environment in the year 2000. During this period, the Port Harcourt Office of FEPA was charged with the responsibility of overseeing both the South-South and South-East Zones from where he gained considerable knowledge and practical experience on the management, protection and regulation of the environment in general including the Oil and Gas sector.

In the year 2000, Engr. Sode was again deployed to the Federal Ministry of Environment Headquarters in Abuja to join hands with other staff in setting up the Oil & Gas Division of the Environmental Assessment department from which the National Oil Spill Detection and Response Agency, NOSDRA was established.

In 2007, Engr. Olufunbi Sode was again deployed to the National Environmental Standards and Regulations Enforcement Agency (NESREA) at its creation. At inception, he was Head of the Extractive Industry Compliance Monitoring (EICM) Division of the Inspection & Enforcement Department and was instrumental to the development of several National Environmental Regulations. He was at various times the Zonal Director of South-South and South-West respectively before his mandatory retirement as an accomplished Director, Regulator, and a passionate environmentalist in 2015. Engr. Sode was part of a Team involved in building capacity of upcoming staff of the Agency.

Apart from his regular schedule of duties, while in public service, Engr Sode was involved in several special activities. These included serving as an EIA Panel Review Member for several developmental projects within Nigeria. He also represented the Director General/CEO of NESREA as well as the Hon.

Minister of Environment at different times at several fora during his service period. Engr Sode monitored and supervised the Demonstration Waste Control Project in Erinfun and Ilokun Waste Control Plants up to Commissioning. Ado-Ekiti, Ekiti State (March – June 2012); conceptualized the project on Environmental Biotechnology for the Enhancement of Compost from Biodegradable Wastes Port Harcourt, Rivers State (July 2011 – Feb. 2012); and was involved in the Preparation of Standardized Guidelines for the Administration of Oil Spill Compensation for NOSDRA, June-November, 2006. He was a member of the Implementation Committee of the Olokola Deep-Seaport and Free Zone Development Study between October 2006 to 2007.

Some of the several training, conferences, and workshops attended by Engr Sode during his public service included:

- Sustainable Weed Management Technologies for Cassava-based Farming System (Use of Herbicide), at the IITA, Ibadan in 2014, and that on Safe & Effective Use of Herbicides in Weed Control in 2015.
- Executive Programme on Strategic Management of Regulatory and Enforcement Agencies at Harvard Kennedy School, USA in 2014.
- Global Inventory Project Workshop (GIP) Technical Review Workshop, Lagos, in 2012.
- Training on the use of Global Positioning System Technology (GPS) organized by NESREA and facilitated by Divine Digital Resources held at Ibadan. 2012.
- UNDP Training Workshop on Ozone depleting substances and the use of Gas Identifier, Lagos in 2010.
- The 65th Session of the United Nations General Assembly, New York, USA.September 2010.
- The Second IUTOX Risk Assessment School on Risk Assessment of Chemicals, Tinapa/Obudu, Cross River State, May, 2010
- International Conference on E-waste Control, ECOWAS Secretariat, Abuja. July, 2009.
- Environmental Management Capacity Building Program for the Nigerian Mining Sector, Abuja. Feb. 2009.
- Environmental Compliance Boot Camp, Metropolitan Resort, Orlando, Florida, U.S.A.
- National Workshop on the Development of Artisanal and Small Scale Mining in Nigeria, Bukuru, Jos. July, 2008.
- Conference on Remediation, Site Closure and Cost of Clean up, New Orleans, Louisiana, United States of America. Nov, 2004.
- Risk-based Corrective Action Workshop Advanced Course (SPDC-organized Workshop), Sheraton Hotel, Lagos. February 2002.

Since retirement, Engr. Sode has been into active environmental consultancy and has at various times been appointed member of EIA Review Panel of several Proposed Projects across the Nation. He is currently engaged as the Managing Director/Chief Executive of FUNTEES Engineering & Environmental Services Limited.

Among four distinguished nominations that were received for the A.F. Oluwole Award this year, Engr Olufunbi O. O. Sode was selected not only for his diligent and patriotic services to the fatherland in the area of Environment-Health, but also for the quiet and selfless manner he carried them out - much like Prof Abiodun F. Oluwole, after whom the award is named.

We are honoured to have Engr O.O. Sode accept our humble recognition of his meritorious and inspiring services to Nigeria in particular and humanity in general, which is marked by a special Plaque. We wish him long life and good health as he continues to serve God and humanity in the critical Environment-Health sector.

PS: The AF Oluwole Award Committee comprised of: Mr Adeleke Ajani (Chair), Dr Adeniyi Oginni, Sanitarian (Dr) Tope Akinwunmi, and Prof Joshua Ojo

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The International Lead Poisoning Prevention Week (ILPPW) takes place every year during the third week of October. The focus of this year's week is "**End Childhood Lead Poisoning**"

## International Lead Poisoning Prevention Week 2023

# End Childhood Lead Poisoning

**The eleventh International Lead Poisoning Prevention Week (ILPPW) will take place on 22-28 October 2023**

The focus of this year's campaign "**End Childhood Lead Poisoning**" reminds governments, civil society organizations, health partners, industry and others of the unacceptable risks of lead exposure and the need for action to protect children's health. The campaign builds on the success in outlawing the use of lead in petrol and the progress achieved by many countries in establishing laws that limit the use of lead in paint, particularly those paints to which children are exposed in their homes, schools and playgrounds.

This webpage provides advocacy materials and technical guidance to support campaigners in organizing events during the week of action and an events registration page where campaigners can showcase their events during the week.

International Lead Poisoning Prevention Week 2023 campaign website

#LeadPoisoning

# INVITED ABSTRACTS

## G01: DIOXINS AS PERSISTENT ENVIRONMENTAL POLLUTANTS: IMPLICATIONS FOR HUMAN HEALTH, MECHANISMS OF TOXICITY, AND POTENTIAL THERAPEUTIC INTERVENTIONS

**Amos A. Fatokun**

School of Pharmacy and Biomolecular Sciences, Liverpool John Moores University, Liverpool L3 3AF, UK.
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Dioxins are a group of persistent environmental pollutants (POPs) that share certain chemical structures and biological characteristics and belong to three main classes: polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), and some polychlorinated biphenyls (PCBs). They are mainly by-products of industrial processes. Their highest levels are found in soils, sediments and food, especially dairy products, meat, fish and shellfish. More than 90% of human exposure to them is through food, as they accumulate in the food chain. Some of the dioxins are highly toxic and can induce reproductive and developmental problems, impair the immune system, interfere with hormones and also cause cancer. Chronic exposure of animals to dioxins has caused cancers, and on the basis of animal data and human epidemiology data, 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), the most studied and most toxic of all dioxins, has been classified by the WHO's International Agency for Research on Cancer (IARC) as a "known human carcinogen". Therefore, as a preventive measure, processes that lead to the formation of dioxins should be strictly controlled. However, as an additional measure, since the toxic effects of dioxins on human cells are mediated by the aryl hydrocarbon receptor (AhR) – a transcription factor – molecules that are AhR antagonists could be developed as therapeutic interventions to mitigate or prevent the deleterious effects of dioxins on human health. We have identified a number of natural compounds with AhR antagonist activity. Intriguingly, we have also found a crosstalk between AhR signalling and signalling by the enzyme poly (ADP-ribose) polymerase (PARP) that is involved in DNA damage repair, a discovery that represents a further avenue for therapeutics development. This conference presentation will, therefore, explore the nature of dioxins, mechanisms by which they induce toxicity and impair human health (e.g., induction of cancers), the policy imperative of regulating and monitoring their levels, and the therapeutic opportunities for mitigating or preventing their harmful effects on human health.

## G02: SETTING NATIONAL DOSE REFERENCE LEVELS FOR DIAGNOSTIC RADIOLOGY IN NIGERIA

Rachel Obed, Department of Physics, University of Ibadan, Ibadan

A large variation in patient doses, for the same type of examination, had been reported in Nigeria in some earlier dose surveys in diagnostic radiology. Due to these observations, there is a need to establish national Dose Reference Levels (DRLs), which is a very important tool for optimizing the radiation protection of patient. The methodology that should be used to set up DRL values in Nigeria has to be harmonized. This paper highlights the guidelines on how to establish and use DRLs taking into account equipment performance and clinical needs. A practical approach on how to set up national, regional and local DRLs is also suggested.

## G03: ECONOMICS AND ENVIRONMENTAL-HEALTH RISK ASSESSMENT FOR SUSTAINABLE DEVELOPMENT OF THE GOLD MINING INDUSTRY IN NIGERIA

Olugboyega A. OYERANTI
Faculty of Social and Management Sciences Precious Cornerstone University, Ibadan

Though the gold mining industry potentially generates employment and increases Nigeria's foreign exchange, the crude practices of artisanal miners often exacerbate environmental degradation and health hazards, as humans face health risks when excessively exposed to the heavy metals released during gold mineralisation. This paper, therefore, adopts a descriptive approach towards suggesting a comprehensive economic evaluation and risk analysis framework in assessing the impact of gold mining industry on sustainable development, especially people's health dimension of sustainability. A review of existing Environment-Health Risk Assessment (EHRA) studies on gold mining areas in Nigeria reveals that the estimated risk quotients are generally above recommended limits, especially with inadequate enforcement of mining precautions. Furthermore, the paper argues that incorporating these EHRA studies with economic evaluations of costs and benefits could provide a benchmark when comparing the various estimated health risk quotients with the returns from more gold mining. For Nigeria's optimal harnessing of opportunities in the gold mining industry, interdisciplinary drive is desirable and considered essential in designing and influencing policy interventions and promoting sustainable development

## G04: ELECTROSMOG POLLUTION: THE RAGING QUIET EPIDEMIC

Joshua O.Ojo

Nutrition and Health-Related Environmental Research Laboratory Department of Physics and Engineering Physics, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria
jojo@oauife.edu.ng

Electrosmog refers to the pollution ("smog") arising from invisible microwave radiation associated largely with modern telecommunication. A report by the Planetary Health Alliance affirmed that there has been about $10^{18}$ times fold change in the level of electromagnetic (EM) radiation in the ambient environment since the 1950s. There is no other area of human existence where such a humongous relative change of magnitude is known to have occurred. Unfortunately, there is no sign of things abating. Measurements from our research group have shown increase densification of Base Transceiver Stations (BTS) in Ile-Ife. For space and aesthetic considerations, more transmitters are simply loaded on existing BTS – without any new Environmental-Impact Assessment carried out. Worrisomely, vulnerable populations such as at hospital neonatal ward, nursery and primary schools, and students' hostels are not spared in this spreading menace. Further worsening matters is increasing popularity in society of hands-free wireless devices employing microwave radiation. At the present time, even the outrageously inappropriate standards recommended by the non-governmental International Commission for Non-Ionizing Radiation Protection (ICNIRP are now being surpassed.

In this presentation, adverse health effects associated with this modern environmental hazard are discussed. These range from general non-specific symptoms known as electromagnetic hypersensitivity and increased susceptibility to infections; to specific adverse effects on the reproductive system, on growth and development, and ultimately various cancers. Also discussed are some recommendations for mitigating the situation at both individual and community levels. At governmental policy level, the importance of due Environmental Impact Assessment, and delineation of Exclusion Zones before BTS are erected, as well as the need to revise the ICNIRP recommendations – based only on thermal effects, and currently applicable in Nigeria, are emphasised.

## G05: OVERVIEW OF ENVIRONMENTAL-HEALTH PRACTICES AT THE REDEMPTION CITY OF GOD: CHALLENGES AND SUCCESSES

Stephen Simidu

## G06: OVERVIEW OF NESREA'S OPERATIONS AT THE LAGOS SEAPORT: CHALLENGES AND SUCCESSES

Amara Udechukwu

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# CONTRIBUTED ABSTRACTS

## I. MODELLING AND COMPUTING
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### C01: MACHINE LEARNING MODEL FOR THE PREDICTION OF DIABETES

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A Machine Learning model capable of predicting diabetes in humans has been developed in this study. The Pycaret module, pre-loaded with fifteen well-known classifiers, namely: Gradient Boosting Classifier (GBC), Light Gradient Boosting Machine (LGBM), Ada Boost Classifier (ADA), Extreme Gradient Boosting (xgboost), Random Forest Classifier (RF), Extra Trees Classifier (ET), Logistic Regression (LR), Linear Discriminant Analysis (LDA), K Neighbors Classifier (KNN), Decision Tree Classifier (DT), SVM-Linear Kernel (SVM), Ridge Classifier (Ridge), Dummy Classifier (Dummy), NaÃ¯ve Bayes (NB), Quadratic Discriminant Analysis (QDA), was employed in the development of this model. The dataset used in this study was sourced from the Kaggle database. The best-performing model, after comparing these models, was found to be the LGBM model. The LGBM was used in the development of the final model. This model, based on the LGBM algorithm, was capable of predicting diabetes in humans with an average Accuracy, Area Under the Curve (AUC), Recall, Precision, and F1 of 97.23 Â± 0.15 %, 97.91 Â± 0.15 %, 68.61 Â± 2.01 %, 98.35 Â±0.64 %, and 80.81 Â± 1.32 %, respectively.

### C02: DIGITAL-BASED NUTRITION ASSISTANT SYSTEM FOR DIABETIC INPATIENTS

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Managing the nutritional needs of diabetic inpatients is a critical aspect of providing effective healthcare. This work presents a Digital-Based Nutrition Assistant System designed to support healthcare professionals in delivering personalized nutrition recommendations to diabetic inpatients. The objective was to assess the prevalence of malnutrition and design a digital-based nutrition system for diabetic inpatients.

The study collected data from referral hospitals in Kigali City using a mixed-methods design. Quantitative data were analyzed using SPSS, while qualitative data helped identify system. The system analyzes patient data including medical history, blood glucose levels, dietary preferences, and nutritional requirements. By combining this data, the system generates tailored meal plans and provides real-time dietary advice to healthcare providers and patients. The system not only assists in maintaining optimal blood glucose levels but also promotes patient engagement in self-care.

The results indicated that 55.3% of the diabetic patients were malnourished, with 6% classified as severely malnourished, 49.3% as having mild to moderate malnutrition, and 44.7% as having normal nutritional status among the 300 patients included in the study. The developed meal recommender system considers local foods, physical activity levels, and glycemic index to provide tailored meal plans. Its strength lies in estimating users' physical activity levels and suggesting meals based on their calorie requirements.

The study highlights the importance of addressing malnutrition among diabetic inpatients and the potential benefits of a personalized nutrition assistant system in improving their dietary management. Leveraging advanced technologies such as artificial intelligence and machine learning Through user-friendly interfaces accessible on various devices, the system enhances communication between patients and healthcare providers, ultimately leading to improved diabetes management outcome

## C03: AN ASSESSMENT OF THE AEROSOL OPTICAL DEPTH AND ANGSTROM EXPONENT OVER ILORIN FOR AIR POLLUTION STUDY

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This study investigates the daily, monthly and seasonal variation of aerosol optical depth (AOD) and Angstrom Exponent (AE) over Ilorin, Nigeria (insert coordinate here). This is with a view to investigate their contributions to the air pollution challenges in the study area.
AOD and AE datasets ( all wavelengths) were obtained from the AERONET station in Ilorin for 10 years (2012 â€“ 2021). The data were further processed by using Python Jupyter Notebook to perform data quality assurance by removing spurious datasets.

The daily time series for the 10-year average of AOD and AE showed that and inverse relationship between the two parameters. The monthly average of AOD (380nm, 440 nm, 500nm, 870nm and 1020nm respectively) recorded their highest values during the dry month of February (~ 1.40, 1.30, 1.20, 0.86, 0.82) while the AE (340-440 nm, 380-500nm, 440-870nm and 500-870nm) recorded their highest during month of August (~ 0.9, 1.1, 1.3 and 1.3 respectively). A boxplot evaluation of the seasonal AOD and AE showed that during the dry season, the average value (~ 0.82, 0.80, 0.78,0.50 and 0.6 respectively)of the AOD is higher than during the wet season (~0.5, 0.48, 0.46, 0.44 and 0.25) and for the dry season AE (~0.56, 0.66, 0.60 and 0.54) and wet season (~0.70, 0.80, 0.60 and 0.6). A further analysis to show that composition of the measure AOD showed that dust source has the largest contribution of about 45% followed anthropogenic (15%), the biomass burning aerosol (BBA) 30% and mixed type sources at ~10%. A trajectory analysis using Hysplit model to show the air mass sources that transported the aerosols to the study location showed that during the dry season most of the airmass were coming from the Sahara region while for the wet season, majority of the air mass were been transported from the Atlantic ocean.

The study concluded that the majority of the sources of aerosols that contribute to air pollution over Ilorin are from dust, BBA, anthropogenic and mixed type. Further study to show the compositions of the mixed type aerosols is desired over the study location.

## C04: DETERMINATION OF $PM_{2.5}$ FROM SATELLITES-BASED AOD AND ITS APPLICATION IN EPIDEMIOLOGICAL STUDIES IN SOUTHWESTERN NIGERIA

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One of the major parameter indicators for air quality is particulate matter (PM) and airborne particles which are called aerosols (WHO, 2006). The impact of PM in the air is alarming and therefore requires continuous monitoring and mitigation strategies to ensure that the inhabiting humans, plants, animals, and the environment at large are kept in the best state for their continuous survival (Katulski et al., 2011). Due to a smaller diameter and quick deposition into the alveolar region of the lungs, PM2.5 among the PMs is considered more toxic. Therefore, many epidemiological studies reported show that exposure to PM2.5 is usually associated with negative health outcomes, such as cancer of the lung, allergic respiratory diseases, hypertension, asthma, stroke, ischemic heart disease, pulmonary inflammation, and cardiopulmonary mortality, and can also reduce people's life expectancy. (Jung, et al., 2021; Atkinson et al., 2001; Pope et al., 2002). According to the report datasets of UN Environment programme (UNEP) Actions on Air Quality which shows that every year globally, seven million premature deaths are linked to air pollution, with children, women, and the elderly most vulnerable especially in developing nations. In the same report, Nigeria suffered a mortality of about 68,533 in total. This translated to 32 deaths per 100,000 people are attributable to fine particle pollution. Hence there is a need for continuous measurement of PM2.5 for informed policies on air quality regulation. However, continuous measurement of PM2.5 is limited and tasking. To overcome this challenge, several studies have utilized aerosol optical depth (AOD) data sets as an alternative to continuous measurement to derive PM2.5. AOD, which is a measure of atmospheric turbidity can be measured in-situ through aerosol robotic network (AERONET) and remotely via satellite-borne sensors like MODIS, MISR, VIIR, SeaWifi etc.

Keywords: Air Pollution; PM2.5; AERONET; Satellite-borne sensors, Nigeria

## C05: EVALUATION OF THE THERAPEUTIC POTENTIALS OF NATURAL COMPOUNDS AGAINST *EIMERIA TENELLA* HEXOKINASE FOR POULTRY COCCIDIOSIS: BIOINFORMATICS AND *IN-SILICO* STUDY

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Coccidiosis infection, caused by *Eimeria tenella*, is majorly found in the intestine of poultry and can be identified by the accumulation of clotted bloody droppings. It has been discovered that just using anticoccidial drugs and vaccines is no longer as effective as poultry has built up a resistance to them. However, this has resulted in searching for alternative therapeutic options to control this disease and natural products have shown promising candidates. We employed molecular dynamics simulation and binding energy analyses to unravel the mechanistic inhibitory potential of five selected natural compounds against hexokinase (HK). Results revealed that CPD4 (Zinc 000002111835) displayed the highest binding activity, with a total binding energy of -32 kcal/mol, compared to other compounds.

The PRED approach identified crucial moieties of CPD4 and several molecular interactions prominent in its binding activity, such as Hydrogen Bond, Pi-Alkyl, and Pi-Anion. PRO160, PHE159, SER158, and ILE240 played significant roles in the effective binding activity of CPD4, as evidenced in their steady complementary interactions exhibited throughout the simulation period. From this study, we recommend CPD4 as a promising lead compound that can further promote more experimental investigations for the design of anticoccidial drugs, addressing the limitations of current therapy options.

***Keywords*:** Coccidiosis, Hexokinase, Natural Compounds, Binding Residues, MM/PBSA, PRED

## C06: THE SPATIAL DISTRIBUTION OF GLOBAL RADIATION OVER SOME LOCATIONS IN SOUTH-WESTERN NIGERIA

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This work examines the spatial trends in incident global radiation across four cities in South-Western Nigeria using a 22-year satellite dataset (January, 1984 - December, 2005) obtained from the Atmospheric Science Data Centre of NASA. Ground data obtained from the Nigerian Meteorological Agency, Oshodi Lagos were used to validate the satellite data. The result indicates that transmissivity values increase with latitude. Both latitude and cloud cover demonstrated observable effects on the spatial variation of the incident radiation. And finally, solar radiation was found to exhibit a positive correlation with maximum temperature but a rather weak correlation with minimum temperature. Key words: Spatial distribution; Incident global radiation; Transmissivity; Minimum, Maximum Temperature.

## C07: DEBTS AND FIRM PERFORMANCE OF LISTED CEMENT COMPANIES IN NIGERIA

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This study reviewed the impact of debts on firm performance of cement industry in Nigeria. The study employed ex post facto research design. The population used in this study is cement industry and the three cement companies listed on the Nigerian Exchange group (NGX) as at 31st December, 2020 were used as the sample. The dependent variables are return on assets, return on capital employed and return on investment (firm performance) while the independent variables are short term debt ratio, long term debt ratio, total debt ratio and debt to equity ratio (Debts). Secondary data were gathered from the financial statement of the sampled cement companies from 2011-2020. Descriptive and inferential statistics calculated with the use of E-views were used to analyze the data. The regression results showed a negative and significant effect of debt-to-equity ratio and term debt on ROA, ROCE and ROI while there was a positive and insignificant relationship between short term debt and ROA, ROCE and ROI. The study also revealed a positive and significant relationship of long term debt on ROA, ROCE and ROI. The results also showed that debts have significant effect on ROA (F-Stat = 24.723, p-value =

0.000, Adjusted $R^2$ = 76.6%), ROCE (F-Stat = 25.289, p-value = 0.000, Adjusted $R^2$ = 77.0%), and ROI (F-Stat = 24.668, p-value = 0.000, Adjusted $R^2$ = 76.6%). It is therefore recommended that the cement companies in Nigeria should have a good debt mix to improve their performance so as to attract more investors.

## II. DIETS AND NATURAL PRODUCTS
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### C08: CONVERGENCE OF HYPERTENSION, SALT AND GUT MICROBIOTA

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Cardiovascular disease is one of the leading causes of death worldwide. Even while receiving adequate pharmacological treatment for their hypertension, people are nonetheless at greater risk for cardiovascular disease. There is growing evidence that the gut microbiota may have major positive and negative effects on blood pressure and illnesses related with it as more study into this topic is conducted.
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Trimethylamine n-oxide (TMAO) and short-chain fatty acids (SCFA) are two major by-products of the gut microbiota. TMAO is involved in the formation of other coronary artery diseases, including atherosclerosis and hypertension, while SCFAs play an important role in controlling blood pressure. Numerous investigations have confirmed the established link between dietary salt intake and hypertension. Reducing sodium in the diet is linked to lower rates of cardiovascular disease morbidity and mortality as well as lower rates of blood pressure and hypertension. In both human and animal research, high salt diets increase local and systemic tissue inflammation and compromise gut architecture. Given that the gut microbiota constantly interacts with the immune system and is required for the correct maturation of immune cells, it is scientifically conceivable that it mediates the inflammatory response.

This review highlights the therapeutic possibilities for focusing on intestinal microbiomes as well as the potential functions of the intestinal microbiota and its metabolites in the development of hypertension.

***Keywords***: Cardiovascular diseases (CVD); Hypertension; Trimethylamine n-oxide; Dietary salt; Gut microbiota

### C09: MICROBIAL LOADS IN FECES OF RABBITS (ORYCTOLAGUS CUNICULUS) FED BIOSLURRY DIET

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This study explores the impact of introducing biogas slurry, a by-product of anaerobic digestion, into the diets of weaner rabbits on their fecal microbial analysis. Weaner rabbits, with developing gastrointestinal tracts, are particularly sensitive to dietary changes. The research aims to determine the feasibility of including biogas slurry in their diets without affecting gut microbiota. Biogas slurry is recognized as a potential cost-effective and sustainable feed source. Ten weaner rabbits were used in this study. The animals were put into three groups using Completely Randomized Design (CRD) for data collection and ANOVA for significance analysis. Samples of the feces of the animal feces were then analysed for Coliform content using membrane filtration. The research findings ($P<0.05$) indicated that weaner rabbits can safely consume biogas slurry at up to 10% of their diets without significant changes in Coliform content.

## C10: WILL NATURAL COMPOUNDS FILL THE CHEMOTHERAPEUTIC GAP IN THE MITIGATION OF CHAGAS DISEASE? A MECHANISTIC PERSPECTIVE AT ATOMISITC LEVEL

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Trypanosoma cruzi, the parasite that causes Chagas disease, spreads to humans and animals through insect vectors that are only found in the Americas, primarily in the impoverished rural areas of Latin America. Up to 8 million individuals in Mexico, Central America, and South America are estimated to be infected with Chagas disease, the majority of whom are unaware of their condition. Infection is a chronic and potentially fatal condition if left untreated. Drugs that are currently on the market were empirically developed more than three decades ago. As a result, they frequently have severe side effects and low efficacy, especially in the common chronic form of the condition. Hence, this has resulted in searching for alternative therapeutic options to control this disease, and natural products could be explored to this effect. We employed molecular dynamics simulation and binding energy analyses to decipher and unravel the mechanistic inhibitory potential of five selected natural compounds as potential inhibitors of T. cruzi glucokinase for treating Chagas disease as an alternative therapy. Results revealed that CPD3 (ZINC 000002345225) displayed the highest binding activity, with a total binding energy of -35.16 kcal/mol, compared to other compounds. The PRED approach identified crucial moieties of CPD3 and several molecular interactions prominent in its binding activity, such as Hydrogen Bond, Alkyl, and Pi-Alkyl. ASN 308, GLY 306, LEU 187, THR 185, GLY 184, and ALA 182 played significant roles in the effective binding activity of CPD3, as evidenced in their steady complementary multiple interactions exhibited throughout the simulation period. In this study, we recommend CPD3 as a promising lead compound that can further promote more experimental investigations for the design of drugs for Chagas disease, thereby addressing the limitations of current therapy options. These results showed that natural compounds could be potential candidates against the inhibition of T. cruzi glucokinase for treating Chagas disease as an alternative therapy.

***Keywords*:** T. cruzi Glucokinase, Natural Compounds, Chagas disease, Alternative therapy, MM/ PBSA, PRED

## C11*: MORINGA OLEIFERA* OIL MITIGATES NEUROBEHAVIOURAL DEFICITS AND CELLULAR ALTERATIONS IN THE PREFRONTAL CORTEX OF RATS EXPOSED TO PERMETHRIN.

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Permethrin, a widely used insecticide, has been reported to induce devastating toxic effects in the brain. Several case reports have shown that the neurotoxicity it causes mirrors neurodegenerative maladies such as Parkinson's and Alzheimer's diseases. This study was conducted to investigate the potentials of a local medicinal herb, *Moringa oleifera* oil (MOO), in ameliorating permethrin-induced neurotoxicity (PIN) in the prefrontal cortex (PFC) of exposed Wistar rats.

Sixteen (16) male Wistar rats with an average weight of 89.6 g were randomly distributed into four (4) groups: Group A (control) was fed on a normal rat diet, Group B was fed with rat chow mixed with 1000 mg/kg of 0.6% permethrin, Group C was fed a normal diet and administered 5 ml/kg of MOO, Group D was fed with rat chow assorted with 1000 mg/kg of 0.6% permethrin and administered 5 ml/kg of MOO. The rats were treated for 14 days after which the behavioural indices for working memory and exploration were assessed using spontaneous alternation Y-maze test and open field test. The rats were subsequently euthanized, their PFC were excised and then processed for cytoarchitectural and Nissl profile examination, using appropriate histochemical procedures. Their oxidative status was also assessed, using an enzyme-based biochemical oxidative marker, such as superoxide dismutase.

From the result obtained, MOO was shown to mitigate permethrin-induced memory decline, promoted explorative tendencies and prevented permethrin-induced oxidative stress in the experimental animals by boosting the antioxidant defense system with consequent amelioration of associated histomorphological alterations. We conclude that MOO was able to reverse most of the effects caused by Permethrin, indicating that it has neuroprotective capabilities.

**Keywords**: PIN, MOO, oxidative stress, cellular alterations and behavioural deficits.

## C12: SKIN CANCER CHEMOPREVENTION THROUGH PHYTOCHEMICALS

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The largest human organ, the skin serves as our defense from harmful substances and other environmental threats. Skin cancers, including both melanoma and non-melanoma skin cancers, may develop as a result of an accumulation of these stressful events. Although contemporary targeted medicines have improved the management of cutaneous malignancies, a safer, more cost-effective, and more efficient chemoprevention and treatment strategy is unquestionably required to improve skin cancer care.

Bioactive substances originating from plants and herbal items are known as phytochemicals. As they exert anti-carcinogenic properties and are widely accessible, well tolerated, and affordable, these substances seem to be helpful in the fight against cancer. According to evidence, phytochemicals' anti-oxidative, anti-inflammatory, anti-proliferative, and anti-angiogenic qualities are what give them their anti-carcinogenic properties. The preventative potential, therapeutic benefits, bioavailability, and structure-activity connection of these chosen phytochemicals for the treatment of skin cancer are discussed in this review.

The information gathered here will offer hints for future research on new phytochemicals with oncostatin properties and further skin cancer prevention strategies.

***Keywords*:** Phytomedicine; Phytochemicals; Cancer; Skin cancer; Chemoprevention

## C13: EFFECTS OF DIFFERENT FRACTIONS OF *Sarcocephalus latifolius* Bruce in RAT LIVER MITOCHONDRIAL MEMBRANE PERMEABILITY TRANSITION (mMPT) PORE *(IN VITRO).*

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Mitochondria have been recognized as an essential pharmacological target for the development of cytotoxic drugs. Many bioactive agents of plant origin have been found to induce Mitochondrial-mediated apoptosis via membrane depolarization, opening of the Mitochondrial Membrane Permeability Transition (mMPT) Pore, osmotic swelling and ultimately the release of cytochrome C. *Sarcocephalus lati*
*olius* is used in folkloric medicine for the treatment of breast cancer but there are no scientific data to support this claim. The study therefore evaluated the *in vitro* effects of varying concentrations of the chloroform (CFSL), Ethyl Acetate (EFSL) and the Methanol (MFSL) fractions of *Sarcocephalus latifolius* (SL) fruits on rat liver mitochondria. Male albino rats (Wistar strain) having a mean weight of 100g were used for this experiment. Rat liver mitochondria were isolated by differential centrifugation. MMPT pore opening, mitochondria ATPase activity and $Fe^{2+}$ induced Lipid peroxidation were assayed spectrophotometrically at 540nm, 660nm, 532nm, respectively.

In the absence of $Ca^{2+}$, CFSL, EFSL and MFSL induced MMPT pore opening in a concentration dependent manner with the induction folds of 2.1, 2.9, 24.5, 29.6, 44, 47.3, 6.1, 7.4, 10.9, 11.1, 11.3, 14.0 and 2.7, 9.2, 11.7, 12.4, 8.5, 8.4 at 20, 60,100, 140, 180, 220µg/ml, respectively. Although, all these fractions opened the pore, the CFSL had the highest activity with peak induction fold at 47.3.

Interestingly CFSL and EFSL inhibited lipid peroxidation, while MFSL induced lipid peroxidation, in a concentration- dependent manner with CFSL having the highest percentage inhibition of 90%. Mitochondrial ATPase activity was significantly-enhanced by CFSL maximally at similar concentrations.

These findings suggest that CFSL and EFSL may contain bioactive agents that can induce MMPT pore opening and subsequently indicate mitochondrial mediated apoptosis. These fractions will be useful for further studies in drug development with respect to diseases that require the up - regulation of apoptosis.

Key words: Mitochondria, Mitochondrial-mediated apoptosis, *Sarcocephalus latifolius* (SL),

## III. ADVOCACY AND PRIMARY PREVENTION

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### C14: INFLUENCE OF SOCIAL SKILLS TRAINING ON MODIFICATION OF HYPERKINETIC BEHAVIOUR IN PRIMARY SCHOOL PUPILS IN OSUN STATE, NIGERIA

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Hyperkinetic behavior (HKB) is a disorder associated with environmental and genetical determinants, which has been established as capable of causing significant disruption in the lives of affected children and those around them, especially in school settings. This can lead to offensive habits and behaviour, resulting in rejection, social isolation, and poor academic achievement. Having previously identified severe and moderate manifestation HKB in nearly 50% of primary school pupils in Osun State, we investigated in this study the use of spontaneous Social Skills Training (SST) by teachers to modify the behavior of affected children. We also studied the moderating influence of pupils' sex on the effectiveness of the technique. This non-pharmaceutical intervention implemented outside of traditional clinic-based settings avoided treating the children as patients or clients. Instead, the study examined natural settings such as schools and classrooms, including interactions with typically-developing peers. This approach bridges the gap between scientific research and practical application by non-medically trained professionals in school settings.

The Study Population comprised of all public primary school pupils and teachers in Osun State. One Local government area was purposively selected from each of the three senatorial districts in the state: Osun Central, Osun East and Osun West. From these, one school was randomly selected and two intact classes of primary three pupils also randomly selected from each school. Primary three was purposively selected because the pupils at this level are between the ages of six and nine years, which fall within the age of symptom manifestation of hyperkinetic behaviour based on DSM-IV criteria. A sample of 118 pupils and 5 teachers were selected for the study.

The results revealed a significant effect of Social Skills Training [$F=11.991$, $P<0.05$] in modifying hyperkinetic behavior. However, there was no significant influence of pupils' sex on the effectiveness of Social Skills Training [$F = 0.166$, $p>0.05$] in reducing hyperkinetic behavior among pupils. The study, therefore, concludes that Social Skills Training is an effective psychotherapy for mitigating hyperkinetic behavior among pupils in Osun State, Nigeria.

## C15: A REVIEW ON THE EFFECTS OF EXCLUSIVE AND PROLONGED BREASTFEEDING ON CHILDREN'S COGNITIVE DEVELOPMENT

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It is a known fact that cognitive development at childhood is essential for an individual's capacity to learn and take advantage of opportunities available within the society (Angelson, 2001). An individual with high intelligent quotient (IQ) stands a better chance of being more successful in both educational and professional careers. Long term beneficial feeding for a child's mental health may not be unconnected with the fact that maternal milk is a rich source of fatty acids and other bioactive components essential for the brain development of infants (Jordyn et al., 2021). It is obvious that there are many benefits associated with exclusive and prolonged breastfeeding (which have been extensively discussed in past conferences) one of which is enhancement of cognitive development. It is however important to back up the awareness of these benefits with data from studies peculiar to our local environment as this will go a long way to convince people about the benefits of exclusive and prolonged breastfeeding than just mere talks. Hence, the need for this review. Sadly, from my findings, I couldn't get a single research done in Nigeria on this. Most of the reviews done were based on findings from international studies some African countries. The study by Michael S. Kramer (2008) showed that exclusive breastfeeding for 6 months or more was associated with a higher verbal IQ by 5.2 points and higher performance IQ by 2.1 points. In another study by Wieslaw., et al 2011, it was found that children exclusively breasfed for 4-6 months had a higher IQ by 2.6 points and the benefit for children breastfed even longer (>6 months) increased by 3.8 points. However, Ambrose (2017) found out from his research in Kenya that there was no significant difference in cognitive development between the exclusively breastfed and the formula fed. It is therefore recommended that Nigerian researchers should focus more on this research area so we can have enough data from our immediate environment to convince more people about the need to adopt exclusive breastfeeding.

Keywords : Exclusive breastfeeding, Childhood, Cognitive development

## C16: TELEMEDICINE IN THE POST-COVID ERA: BENEFITS, CHALLENGES, AND IMPLICATIONS

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This rapid review synthesizes secondary data sources to analyze the role of telemedicine in the transformation of healthcare delivery during and after the COVID-19 pandemic. It elucidates the benefits, such as increased healthcare accessibility and efficiency, while addressing challenges like data security and reimbursement policies. The implications of telemedicine's continued integration into healthcare systems are discussed, underlining the importance of adapting healthcare strategies to the evolving telehealth landscape.

## C17: THE IMPACT OF DEPRESSION FATIGUE AND ANXIETY ON SLEEP QUALITY OF STROKE SURVIVORS

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Stroke is one of the most common disease that leads to death and varying disabilities which is associated with symptoms that arise from the burden that this creates which includes; sleep disturbances, depression, anxiety and fatigue. Existing literature has revealed that mood and fatigue levels affect the depth and length of sleep of stroke survivors creating sleep disorders such has: sleep wake disorders and insomnia.

The study aimed at determining the relationship between post stroke depression, post stroke fatigue post stroke anxiety and sleep quality in stroke survivors attending the Osun State University Teaching Hospital and State Specialist Hospital, Asubiaro.

A cross sectional design and convenience sampling technique was used to recruit fifty (50) stroke survivors. A socio-demographic form was used to collect the socio-demographic details of the participants, Patient Health Questionnaire-9 was used to assess post stroke depression, Fatigue Severity Scale was used to assess post stroke fatigue, Generalized Anxiety Disorder-7 was used to assess post stroke anxiety and Pittsburgh Sleep Quality Index was used to evaluate the sleep quality of stroke survivors. Descriptive statistics of frequency, percentage, mean, median, standard deviation and interquartile range were used to summarize the socio-demographic and clinical variables Spearman rho correlation coefficient was used to determine the relationship.

The prevalence/ presence of post stroke depression, post stroke fatigue, post stroke anxiety and poor sleep quality was present in 27.4%, 80.4%, 29.4% and 23.5% of the participants respectively. Conclusion: Results from the study showed a significant relationship between post stroke depression, post stroke anxiety and sleep quality but there was no significant relationship between post fatigue and sleep quality.
Key words: Depression, Fatigue, Anxiety, Sleep Quality.

## C18: DETERMINANTS OF HOSPITAL SOLID WASTE COMPOSITION OF OBAFEMI AWOLOWO UNIVERSITY TEACHING HOSPITAL COMPLEX (OAUTHC) ILE-IFE, NIGERIA.

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Hospital solid waste dumped indiscriminately into the municipal bins often increases the chances of survival and mutation of pathogenic microbial population in the waste. Therefore, this study examined the determinants of hospital solid waste composition in Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Ile-Ife. Data were obtained from both primary (Actual measurement of waste in kg) and secondary sources. Waste produced in the wards and clinics were measured for seven days in each week over the period of three months. The study showed that sharps and general waste produced in wards represented 27.3 and 72.7%, respectively. The study also showed that the highest quantity of wastes was generated on Monday representing 15.17%, while the least quantity was on Sunday (11.54%).

The daily and weekly per capita waste quantities generated in the wards of OAUTHC were 0.799 and 5.689 kg, respectively. The study concluded that the methods and materials of waste storage in OAUTHC were not in conformity with World Health Organization standards.

Keywords: Solid waste; Hospital solid waste; Waste composition; Disposal practices

## C19: ASSESSMENT OF PSYCHO-SOCIAL FACTORS INFLUENCING URBAN POLLUTION

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This paper presents a comprehensive study of the assessment of the intricate web of psycho-socio factors influencing urban environmental pollution. Mankind involvement and activities in the environment in their quest for social and economic ventures have contributed to a large extent to degradation as well as depletion of the environment and the entire ecosystem. This study adopts qualitative/theoretical approach in providing insights from psychological and sociological findings in elucidating the pivotal role played through human and social dynamics in urban pollution by evaluating their interplay with urban context. The process of the study also involves extensive investigation of empirical and theoretical findings in the field of psychology and sociology relating to urban pollution, influenced by human behavior and social structures. Relevant documents relating to human environment pollution were also perused to enhance the quality of this paper.

Specific attention was given to studies examining individual human behaviours, community norms, socio-economic influences, and the impacts of access to green spaces on pollution level. The findings from this comprehensive review will contribute to deeper understanding of the complex human involvement and behaviour driving urban environmental pollution. The study also reveals a nuanced interplay of psycho-socio factors influence on urban environmental pollution. The key findings of the study identified individual attitudes and behaviours towards waste disposal and resource consumption; ideology of the divine way; the values of growth, materialism and individualism; community norms, socioeconomic status; age, education and occupation as determinants of behaviour towards the environment. The environmental problem is maintaining a balance ecosystem between the people and their natural environment. Hence, to achieve this, the researchers recommend community based engagement and campaign, behavioural orientation and environmental health education and renewed government policy as ways of sustaining environment protection in the urban centres.

Keywords: environmental depletion, psychosocial factors, human behaviour, community engagement, social dynamics.

## C20: ADSORPTION PROPERTIES OF POLYETHYLENE TEREPHTHALATE-BASED ADSORBENTS FOR THE REMOVAL OF POLYCYCLIC AROMATIC HYDROCARBON FROM DOMESTIC WATER SUPPLY

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Polycyclic aromatic hydrocarbons (PAHs) are group of priority pollutants categorized as persistent hazardous contaminants. The study assessed the adsorption of fluoranthene by application of activated carbon (AC) developed from polyethylene-terephthalate (PET). Batch adsorption experiments were performed and varying parameters such as adsorbent dosage (0.2, 0.4 and 0.8 g), contact time (30, 45 and 60 minutes), pH (2, 5, 7 and 9), and concentrations (0.001, 0.01, 0.03, 0.06 and 0.09 mg/L) were optimized for adsorption of Fluoranthene using CM-CAPAC and CAPAC. Experimental adsorption data from varied concentrations of Fluoranthene were applied to investigate conformity with Langmuir and Freundlich isotherm models. Percentage recovery from the procedure ranged from 88.89±0.00 to 100±0.00. The mean percentage adsorption efficiencies for simulation experiment were 100% at initial concentration of 0.001, 0.01 and 0.03 mg/L for CAPAC and CM-CAPAC respectively, while it increases from 33.0% and 50.0% to 77.8% and 88.9% at concentration of 0.06 and 0.09 mg/L for CAPAC and CM-CAPAC respectively. Optimum conditions were 0.8 g adsorbent dosage, 45 minutes contact time, pH 7, and 0.001 mg/L initial concentration for CAPAC and CM-CAPAC respectively. Result of optimum value parameters utilized for adsorption of Fluoranthene in water treatment facility gave 100±0.00% for both CAPAC and CM-CAPAC respectively. Physicochemical parameters of the water treatment facility decreases after adsorption experiment except conductivity which increased from 0.23±0.02 and 0.24±0.02 ($\mu$S/cm) to 25.00±0.02 and 13.56±0.05, and 33.12±0.02 and 37.65±0.03 ($\mu$S/cm) for both CAPAC and CM-CAPAC respectively. Desorption and reusability test revealed the regenerated CAPAC and CM-CAPAC can still be utilized for adsorption for at least three time with uptake capacity of 100±0.00 for both adsorbents under study without losing their adsorption efficiency. Experimental data best fit into Freundlich than Langmuir adsorption isotherm.

**Keyword: Adsorption, Chitosan, Cocoa Ash, Fluoranthene, Polyethylene Terephthalate.**

## C21: PHYSICO-CHEMICAL PROPERTIES OF BREEDING AND NON-BREEDING HABITATS FOR ANOPHELES MOSQUITOES

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A lot of factors contribute to the breeding of Anopheles mosquitoes, especially vectors of malaria parasites. This indirectly contributes to the transmission of these parasites. The physicochemical parameters associated with the population of Anopheles larvae breeding and none breeding sites were studied in Ado, Oye and Efon-alaye Local Government areas of Ekiti State. The results for the physiochemical parameters, pH, Temperature, Dissolved Oxygen, Electrical conductivity, Total dissolved solids, and Salinity at Breeding Sites in the 3 LGAs respectively, were: Oye LGA - 8.43, 33.3ºC, 54.7, 519, 367, 0.46; Ado: 8.17, 4.1, 38.9, 356, 2.35, 1.7 and Efon alaye 7.98, 1.65, 33.8, 671, 227, 0.33 . The corresponding values for non breeding sites waste, 8.4, 33.8, 1.9, 763, 538, 0.37 respectively. The study revealed the important physicochemical parameters that influence the abundance of Anopheles larvae in the study area. Manipulation of these important parameters could help in reducing the population of the immature stages of this vector.

## C22: MICROBIAL ASSESSMENT OF INDIGENIOUS BRANDS OF PARACETAMOL AND CHLOROQUINE SYRUPS.

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Microbial assessment of indigenous brands of paracetamol and chloroquine syrups is an important aspect of ensuring the safety and efficacy of these drugs. A total of six sample of unexpired indigenous brand of paracetamol and chloroquine syrups were purchased from Owerri market in Imo state. The Paracetamol sample were labeled A, B, and C while Chloroquine sample were labeled X, Y, Z. The samples were examined for total heterotrophic count, total coliform count, yeast and mould count. The media used were Nutrient agar, MacConkey Agar, potato dextrose agar and salmonella-Shigella Agar. Colonial Morphology, gram staining and biochemical test were used for identification and characterization of isolates. The total heterotrophic bacteria count were $4.0 \times 10^5$ $2.4 \times 10^2$ ,$4.1 \times 10^5$, $1.2 \times 10^2$, $1.0 \times 10^2$, $1.2 \times 10^5$ cfu/ml while fungi were $5 \times 10^3$, $1.2 \times 10^4$, $2 \times 10^3$, $2.6 \times 10^4$, $3 \times 10^3$, $4 \times 10^3$ cfu/ml for sample A, B, C, X,Y and Z respectively. Gram positive isolates were *Bacillus cereus, Corynebacterium sp., Staphylococcus saprophyticus. Saccharomyces cerevisiae, Saccharomyces uvatum*, while *klebsiella sp.* And *Pseudomonas aeruginosa* constituted the gram negative rods. The high microbial load is a concern and is indicative of substandard product, and is attributed to non adherence to current good manufacturing practice (CGMP). Quality control measures and strict compliance to this practice will consequently reduce the incidence of contamination and guarantee good quality product in order to ensure the safety and efficacy of these drugs

Keywords: Microbial assessment, Pharmaceutical syrups, Indigenous brands, Quality control measures, Isolates.

## C23: THE NEXUS BETWEEN CLICKTIVISM AND ENVIRONMENTAL HEALTH: DIGITIZING WASTE COLLECTION AND RECYCLING

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CLICKTIVISM is a clip-and-blend word, dissected as CLICK (online) and ACTIVISM (action taken, often militant). It is a digital (online) activism that refers to the use of the digital solutions and innovations (basically the internet) to advance social causes like the environment, and most importantly take actions like environmental campaigns and public awareness to promote civic engagement and advocacy, data gathering for online petitions, etc. This is a concept of using the internet to take direct and often militant action to achieve a political, social and in this case, environmental aim.

In recent years, the world has witnessed an alarming increase in Natural disasters like floods, hurricanes, and wildfires etc. These events have caused immense loss of life and led to significant environmental damage. As a result, there is an urgent need for effective mitigation strategies to help minimize these

disaster impacts. Mitigation strategies encompass a wide range of measures aimed at reducing the vulnerability of communities and ecosystems to Natural hazards in building a sustainable environment.

Now, CLICKTIVISM plays a role here. As part of mitigation strategies, we need to establish early warning systems that can provide timely information about impending disasters, so safeguard the health of our environment. Our online (and most importantly by extension, onsite) activism and awareness drive will educate communities about the risk that they face and empower them to take appropriate actions and for instance, address the long-term challenge of climate change. These efforts will be pivotal in greenhouse gas emission reduction through renewable energy source, sustainable agriculture practices promotion, clean energy-efficient technology adoption.

Digital solutions and innovations like the Social Media and Mobile apps. provide data that are useful for decision making. Mobile Apps. for plastic recycling e.g Pakam, Junkyard, Pet Points Technology and Trashcoin etc. leverage digital technology that reduces plastic wastes pollution. Also, when collecting information from people, especially about personal health and their environment, it is important to make sure that the media platforms gathering the data have built-in feedback loops so that people receive something in return for contributing data. Mobile apps. have created a regulated source for recycling, which has the potential to influence the circular economy, by connecting waste producers to recyclers, profile waste pickers and collectors and ensure traceability against security threats. These digital solutions and innovations (by initiating pickups and drops offs with use of mobile apps. from mobile phones) have reduced carbon footprints, and emissions, to the environment, with the use of tricycles and smart carts (in a decentralized manner), that have reduced the pressure of logistics, on heavy-duty trucks.

## C24: PERCEIVED PROSPECTS OF RADIO AGRICULTURAL DRAMAS IN AGRICULTURAL INFORMATION DISSEMINATION BY SOME STAKEHOLDERS IN OYO STATE, NIGERIA

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Various means of communication strategies have been used over the years for the popularization of new ideas and change in overt behaviour of target population even though, the achievements and appropriateness of these strategies have left more questions than answers. The success stories of few programmes on radio, that utilise entertainment-education (EE) format, coupled with the potency of radio as a medium of communication, project the medium as one with a lot of potentials. Therefore, this study examined perceived prospects of radio agricultural dramas in disseminating information by some stakeholders in Oyo state.

A multistage sampling technique was used to select 120 farmers from three local governments from the three senatorial districts. An open and closed ended questionnaire, made up of different questions, was developed for collecting information from the farmers, while in-depth interview guide was used to elicit information from agricultural producers and presenters. Quantitative data were subjected to statistical analysis using frequency counts and percentages, Chi-square ($\chi^2$), and Pearson Product Moment Correlation (PPMC) while, qualitative ones were analysed for consensus.

The results of the analyses showed that many (45.5%) of the farmers were between 31 and 40 years. Majority of them were males (82.8%), Muslims (77.8%) and married (79.8%). Majority had primary school education (56.6%), into crop production (48.5%) and used their personal land for agricultural

purposes (83.8%). Furthermore, most of the farmers owned radio sets (97.0%), had them in good working condition (96.0%), listened to the radio (94.9%) and used battery as their energy source (85.9%). Splash FM was the best station in terms of reception (91.9%) and was the most listened to (86.9%) in the study area. The study further revealed that majority (70.7%) of the farmers regularly listened to the radio with 92.9% preferring to listen to their radio sets in the evening. Majority of the farmers (66.7%) listened to radio agricultural broadcasts with 70.7% listening from beginning to the end and showing a favorable perception to radio agricultural broadcasts. There was no significant relationship between farmers' sex ($\chi^2$ = 0.057, $p \geq 0.05$), marital status ($\chi^2$ = 5.103, $p \geq 0.05$ ) , religion ($\chi^2$ = 2.121, $p \geq 0.05$) and their perception of the prospects of radio agricultural drama in agricultural information dissemination. There were however, significant relationship between age ($r = 1.000$, $p \leq 0.05$ ), farm size( $r = 0.206$, $p \leq 0.05$ ), frequency of listening to radio ( $r = -0.329$, $p \leq 0.05$ ) and farmers 'perception of the prospects of radio agricultural drama in agricultural information dissemination. Meanwhile, the media practitioners indicated that they were willing to use radio dramas as a means of disseminating agricultural information The study concludes that, although, radio agricultural drama is grossly underutilised as an agricultural information dissemination tool as at present, farmers are favorably disposed to it , while media practitioners are willing to utilise it if properly sponsored by the government and private organisations.

**Keywords**: Farmers' perception, Radio listenership, Agricultural drama.

## IV. HEAVY METALS, E-WASTES, AND TRACE ELEMENTS

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### C25: DETERMINATION OF TRACE ELEMENTS CONCENTRATION IN SELECTED VEGETABLES FROM HIGH AND LOW CANCER PREVALENCE AREAS IN ONDO STATE, NIGERIA

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An earlier report from our Laboratory shows that cancer incidence recorded from Ondo West was thrice that of Ondo East. This difference was alarming and needed to be investigated. Various reasons could be responsible ranging from geological differences, quality of water and food intakes, and air quality. Of all the food items, vegetables prove to be the most viable indicator because it is mainly consumed within the community where it is grown, therefore, concentrations of some selected elements of some common vegetables consumed in the areas are studied in this work to establish a possible link with the difference in cancer prevalence reported for the two areas.

Five different vegetables; Solanum macrocapon (African eggplants vegetables), Talinum triangulare (Water Leaf), Amaranthus hydride's, (African Spinach) Telfairia occidentalis (fluted pumpkin leaf) and Vernonia amygdalina (Bitter leaf) which are commonly consumed in Ondo East and Ondo West, sourced from five different locations from each region, were oven dried and subjected to elemental analysis using Atomic Absorption Spectroscopy (AAS). The mean concentration of daily intake of metals (DIM) and Health Risk Index (HRI) were then calculated from the AAS results. The two sets of results were also

subjected to statistical analysis (t-test) to determine if the difference between the two data sets is significant.

The results obtained show all the investigated trace elements are within the permissible limits across the two regions except lead (Pb) concentration. The lead concentration in all the vegetables across the two regions is between 200% to 300% of the permissible limits. The HRI exceeded the safe value of 1 for Pb in both areas, suggesting a health risk due to lead intake from vegetables in the two regions. The T-test result also shows that the difference between the two sets of data is not statistically significant with a p - value of 0.23.

The study concluded that the difference in cancer incidence for the two regions cannot be attributed to the pollution level of vegetables consumed in the regions.

Keywords: Trace element, Health Risk, Heavy Metals, Daily intake of metals, Vegetable.

## C26: ASSESSMENT OF LEAD (Pb) AND ARSENIC (As) IN ALCOHOLIC BEVERAGES IN NIGERIA AND THEIR ASSOCIATED HEALTH RISKS

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Beverages are consumed in Nigeria irrespective of age, sex, and socioeconomic status. Beverages may be alcoholic (wine, spirits, and beers) or non-alcoholic (soft drink, energy drinks, candies, chocolates, milks). Notwithstanding, most beverages are packed in cans, bottles, and plastics. This project investigated the concentration of heavy metals from some commercially-packaged beverages consumed in Nigeria. 20 brand of beverages were firstly digested in the laboratory before the assessment of lead and arsenic in all of the digested 20 brand alcoholic beverages. These selected heavy metals in selected Nigerian drink/alcohol were estimated by atomic absorption spectroscopy (AAS) and inductively coupled plasma optical emission spectrometry (ICPOES). The study found that heavy metal concentrations, including lead and arsenic seldom exceed the maximum contaminant level recommended by the standard organization of Nigeria (SON) and the world health organization (WHO) as applicable to drinking water resources. The occurrence of heavy metals in the beverages could have resulted from the feedstocks and water used in their production. Consumption of beverages high in heavy metal could be toxic and cause adverse effect to human health, depending on the rate of exposure and accumulation dosage. This study concludes by suggesting that heavy metal concentration in the feedstocks and water should be monitored by producers, and its concentration in beverages should also be monitored by appropriate regulatory agencies.

There have been reports of the presence of heavy metals at a concentration above the limits specified by the world health organization (WHO) for food and drink products in Nigeria. This work was designed to compare the levels of lead and arsenic in selected Nigeria drink/alcohol with the specified recommended limits by the world health organization. This study therefore revealed that large amount of lead and arsenic present in those beverages should be properly monitored/investigation by the regulatory agency which should be in accordance by the recommended regulatory agency regulating alcoholic beverages in Nigeria

Keyword: Heavy metal, Beverages, Alcohol, Nigeria

## C27: SIMULTANEOUS DETERMINATION OF TRACE ELEMENTS IN VEGETABLES FROM ONDO CITY USING PARTICLE-INDUCED X-RAY EMISSION TECHNIQUE

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PIXE can detect a high number of elements with a high sensitivity (ppm range) in a simple and fast way. In the present study, Particle Induced X-ray Emission (PIXE) method has been used to identify the elements present in some commonly consumed (vegetables) in Ondo West and Ondo East, southwestern Nigeria. This study investigates the elemental concentration of five selected vegetables: *Solanum macrocarpon* (African egg plants vegetables)*, Talinum triangulare* (Water Leaf)*, Amaranthus hydride's,* (African Spinach) *Telfairia occidentalis* (fluted pumpkin leaf) *and Vernonia amygdalina* (Bitter leaf) present in Ondo East and Ondo West. The samples were prepared for irradiation following conventional methodology and irradiated with 2.5 MeV collimated protons from the 3 MV tandem accelerator of Centre of Energy Obafemi Awolowo University, Ile -Ife. Concentrations of some heavy metals (Cd and Co) were found in all vegetables while Ni was found in some vegetables. PIXE didn't detect Pb in any of the vegetable samples. A total of twenty-seven (27) elements ranging from Sodium (Z=11) to Terbium (Z=65) were found in all or some of the samples. Eighteen (18) elements (Na, Mg, Al, Si, P, S, Cl, K, Ca, Ti, Mn, Fe, Co, Zn, Nb, Cd, Cs and Ba) were found in all 10 samples, while three (3) elements Br, Rb, and Cu were found in 9 samples. Sn was found in 8 samples, while Tb and Sr were found in 7 samples. Ni was found only in 6 samples, while Ga and Cr were found only in 3 samples. The number of elements found reflect their abundances in the samples, as well as the detection limits permitted by PIXE. Potassium has the highest concentration of elements present which was found in *Vernonia amygdalina* in Oboto (6561.93 ppm) while bromine has the minimum concentration of elements present is found in *Vernonia amygdalina* in Ondo town (0.18 ppm). Finally, this methodology can be considered convenient for identifying the possible sources of metals in environmental vegetable samples. In all over the world such analysis is running routinely to ensure the good health and quality of life of human being.

**Keywords:** Trace element, PIXE, Vegetables, elemental, health effects

## C28: HEAVY METAL POLLUTION IMPACT ASSESSMENT OF A RECLAIMED GOLD MINE TURNED RESIDENTIAL AREA AT MOKURO AREA, ILE-IFE

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Mokuro area of Ile-Ife. South West Nigeria was well known for Gold Mining in the past (about twenty years ago). However, the place has since been reclaimed and converted to residential area without any environmental risk assessment of the impact of the mining tailings on the environment.

Soil, water, and plant samples were collected from 4 different locations, around the mine turned residential area, soil samples were pulverized and sieved into finer particles while the plant samples were dried and pulverized. All the samples were digested and analyzed for As, Pb, Cd and Zn using Atomic

Absorption Spectroscopy (AAS). From the nalysis results, Hazard Index (HI) was then calculated for the metals.

The analysis showed that As, Pb, Cd (Toxic metals), and Zn (essential trace metal) are in concentrations lower than permissible limits in plants and soil samples while the water samples had concentrations higher than permissible limits. The calculated health indices showed that HI for water is >1 and that of plants and soil is <1. The study therefore concluded that the soil in the study area are safe for planting, and the plants are safe for consumption, but the water bodies are not safe.

## C29: POLLUTION STATUS AND HEAVY METAL SPECIATION OF SOIL, AT A GOLD MINING SITE, IN IBODI-IJESA, SOUTH-WEST, NIGERIA.

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The concentration of heavy metals; (Cu, Co, Cd, Pb, As and Ni), was determined in soil samples at a gold mining site in Ibodi-Ijesa, Osun State, Nigeria. A total of 66 soil samples were collected randomly from separate points in the site at a depth of 0 – 15 cm, with the aid of a soil auger, within the distance 0 - 500 m, at 100 m radius each, from the four cardinal points (north, east, west and south). A control sample was taken at a reasonable distance away from any mining site. The soil samples were mixed to form six composite samples for all the distances before been subjected to Atomic Absorption Spectroscopy (AAS) for heavy metal analysis. The result showed that, the concentration of copper (80.172 - 100.115 $\mu gg^{-1}$), cobalt (42.114 - 50.069 $\mu gg^{-1}$), lead (30.934 - 54.00 $\mu gg^{-1}$) and nickel (35.297 - 44.198 $\mu gg^{-1}$) present in soil samples within the study area were all significantly higher than those at the control site. Heavy metal speciation levels of Cu in the different geochemical fractions followed the order; 11.021 - 21.500 $\mu gg^{-1}$ (water soluble); 9.013 - 17.001 $\mu gg^{-1}$ (exchangeable metal); 13.038 - 19.041 $\mu gg^{-1}$ (carbonate bound); 8.024 - 17.068 $\mu gg^{-1}$ (Fe-Mn oxide bound); 11.030 - 21.069 $\mu gg^{-1}$ (organic bound) and 12.083 - 20.192 $\mu gg^{-1}$ (residual); Showing, substantial bioavailability. The Integrated Pollution Index shows an irregular trend across the distances in the following order: 100 m (1.346) > 400 m (1.243) > 0 m (1.223) > 200 m (1.210) > 300 m (1.197) > 500 m (1.197) (1.162). The study concluded that gold mining activities in Ibodi-Ijesa had impacted the soil quality through increased concentration of heavy metals which has polluted the area.
**Keywords:** Speciation, Heavy metals, Ibodi-Ijesa, Gold mining, Pollution Status.

## C30: ATOMIC ABSORPTION SPECTROSCOPY OF HEAVY METALS IN CANCEROUS BREAST TISSUES AMONG WOMEN IN JOS, NIGERIA.

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Breast cancer is prevalent in northern Nigerian women most especially Jos, Plateau State owing to anthropogenic activities such as solid earth mineral mining. In this study, Atomic Absorption Spectrometry was used to determine the levels of eight heavy metals (Cd, As, Cr, Cu, Fe, Pb, Ni and Zn) in cancerous and non-cancerous breast tissues of Jos Nigerian Women. The concentration of heavy metals ranged from 1.08 to 29.34 mg/kg, 0.29 to 10.76 mg/kg, 0.35 to 51.93 mg/kg, 5.15 to 62.93 mg/kg, 11.64 to 51.10 mg/kg, 0.42 to 83.16 mg/kg, 2.08 to 43.07 mg/kg and 1.67 to 71.53 mg/kg for Cd, As, Cr, Cu,

Fe, Pb, Ni and Zn respectively. Using MATLAB R2016a, significant differences (tv = 0.0041 â€“ 0.0317) existed between the levels of all the heavy metals in cancerous and non-cancerous breast tissues except Fe. At 0.01 level of significance, positive significant correlation existed between Pb and Fe, Pb and Cu, Pb and Fe, Ni and Fe, Cr and Pb, as well as Ni and Cr (r = 0.583 â€“ 0.998) in cancerous breast tissues. Using ANOVA, significant differences also occurred in the levels of these heavy metals in cancerous breast tissues (p = 1.910510Ã—10^(-26)). The relatively high levels of the cancer-induced heavy metals (Cd, As, Cr and Pb) compared with control indicated contamination or exposure to heavy metals which could be the major cause of cancer in these female subjects.

## C31: POLICY AND REGULATORY FAMEWORKS FOR ADDRESSING E-WASTE AIR POLLUTION IN NIGERIA

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E waste, electronic waste, e scrap and end- of -life electronics refer to used electronics that are nearing the end of their useful life and discarded, donated or recycled. This category of waste according to UN contains battery, plug and other features toxic and hazardous e.g. Lead, Cadmium and Mercury posing serious risk to human and environmental health. It is worthy of note, the presence of precious/valuable substances eg gold, silver, copper.

In Nigeria today, the rate of E waste generation is alarming, with Lagos Port alone receiving more than 60,000 tonnes of shipped E-waste annually according to UN Research. Air Pollution due to improper handling of E-waste arise from emissions of toxic and hazardous gases during open burning of mingled waste at designated dumpsite and at household levels.

Proper and careful handling of E-waste in Nigeria is being carried out through Policy and Regulatory Frameworks/Guidelines at Federal and State Government levels in conjunction with relevant Stakeholders. There are challenges along the line that are being tackled, going forward to ensure air quality is not compromised.

# V. RADIATION AND RADIOACTIVITY

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## C32: POSSIBILITIES OF RAPID ASSESSMENT OF NORM IN OIL RIG WASTE PRODUCTS FOR ENVIRONMENTAL COMPLIANCE MONITORING

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Evaluation of Naturally-Occurring Radioactive Materials (NORMs) traditionally takes about a month to accomplish. This is because two of the major naturally-occurring primordial radioisotopes, and U and 232Th, decay into daughter products, which are themselves serially radioactive. Included in both series is the radon gas, which continuously diffuses away, and therefore keeps the system in perpetual disequilibrium. The one-month wait is therefore required to seal up the sample after preparation and allow for the establishment of secular equilibrium within the series. This technical situation could have enormous socio-economic implications in applications, where NORMs need to be routinely evaluated as rapidly as possible. One major example is in the tons of waste products from the oil and gas industry, which could be deployed for other economically-beneficial applications in the public space, provided their compliance with relevant regulatory limits for radioactivity level could be ascertained in a timely manner. Previous workers trying to resolve this quagmire had suggested innovative protocols involving sequential counting of the sample on different days. However, these are generally too complex and laborious for routine applications, especially in an industrial setting involving many samples.

In this work, we have directed our attention primarily on incinerated ash obtained as secondary waste from oil sludge, and clinkers produced with this ash. We simply evaluated the activity concentrations attributed to the 238U and 232Th series in the two matrices at various pre-secular equilibrium waiting periods and compared with results obtained after secular equilibrium. By applying basic principles of risk assessment, we could then propose that samples with maximum activity level of 1,175 Bq/kg for 234U and 700 Bq/kg for 232Th measured at any time pre-equilibrium, will meet the 10,000 Bq/kg limits specified in the Nigeria Basic Ionizing Radiation Regulation 2003, for both radionuclides at secular equilibrium.

Keywords: Activity concentration; NORMS; Secular equilibrium; Incinerated ash, Clinkers

## C33: INVESTIGATION OF BACKGROUND RADIATION IN SELECTED MARKET AREAS IN ILE-IFE AND MODAKEKE, OSUN STATE

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In the terrestrial environment, humans are constantly exposed to the naturally occurring ionizing radiations through natural or anthropogenic sources of radiation. There are a lot of human activities going on in the market. There are different materials and products available in the market and can come from places where radiation dose level are not yet determined, the radiation concentration might be high at the sources they originate. An in-situ measurement of outdoor radiation dose rate was carried out at some selected market in Ile-Ife and Modakeke, Osun State, Southwestern Nigeria using FNIRSI GC-01 Geiger Counter Nuclear Radiation Detector. The radiation dose rate and health hazard indices for these selected markets were determined. The mean average dose rate for New Market, Adedoyin Market, Sabo Market, Sasa Market, Texaco Market and Akinola Market are: 0.19±0.01 µSv/h, 0.15±0.003 µSv/h, 0.16±0.003 µSv/h, 0.17±0.003 µSv/h, 0.17±0.01 µSv/h, and 0.16±0.002 µSv/h, respectively. The mean average dose rate all these markets exceed the world average dose rate of 0.13 ÂµSv/h The mean absorbed dose rate for the respective markets are: 168.78±10.61 nGy/h, 130.8±1.45 nGy/h, 135.1±2.57 nGy/h, 150.51±2.73 nGy/h, 149.40±6.74 nGy/h, and 137.5±1.45 nGy/h, which all exceed the world absorbed dose rate of

59nGy/h. The mean annual effective dose rates estimated for the respective markets are; 1.63 Â± 0.09 mSv/y, 1.26 ± 0.01 mSv/y, 1.31± 0.02 mSv/y, 1.45 ± 0.02 mSv/y, 1.44 ± 0.06 mSv/y and 1.33±0.02 mSv/y. These values are below the world average value of 1mSv/y. The lowest mean excess lifetime cancer risk was estimated at 0.17 ± 0.002 —10 -3, and 0.18 ± 0.005 —10 -3 for Adedoyin Market and Akinola Market which is due to their occupancy factor of 0.06 and these values are below the world average of 0.29 —10 -3. The rest of the selected market are all above the world average of 0.29 —10 -3. This study concludes that there is no immediate risk posed to traders and patrons of these markets, however there could be a long-term effect on the traders of these markets.

## C34: ASSESSMENT OF NATURAL RADIOACTIVITY IN ENVIRONMENTAL SAMPLES (SOIL AND WATER) AND ASSOCIATION WITH CANCER PREVALENCE IN EKITI STATE, NIGERIA

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It has been established that natural background radioactivity is one of the causative factors of cancers in humans and high background radioactivity has been connected with locations with enriched granitic rocks. This study therefore sought the possible association between background radioactivity and cancer prevalence in selected LGAs in Ekiti State. Materials and Methods: Demographic data of cancer patients were obtained from Ekiti-State Cancer Registry, Ido-Ekiti and the Federal Teaching Hospital Ido, (FETHI). Eleven towns were randomly selected from the cancer patients' locations, 1 water sample from each location and 35 soil samples across the study area. Ambient exposure rate measurements at the locations were performed using gamma advanced survey meter (ASM) Ludlum model 44-9 with a pancake G-M detector. Soil and water samples were also collected from the locations and analyzed for background radioactivity using CsI(Tl) gamma spectrometry. Data on cancer patients that registered over a period of five years (2016 to 2020) were obtained from Ekiti State Cancer Registry hosted by the Federal Teaching Hospital, Ido-Ekiti, Ekiti State. Google map was employed to extract the coordinates (longitudes and latitudes) of the locations of the patients and ACR-GIS software was used to place the locations on the map of Ekiti State. The in-situ ground-based measurements of ambient exposure rate due background ionizing radiation (BIR) were taken using calibrated gamma survey meter as well as soil and water samples for laboratory using CsI(Tl)-facilitated gamma spectrometry. The multiple regression model was used to correlate the effects of the contributions from the three variables (ambient exposure rate and annual effective dose equivalent of soil and water) with reported 5-year cancer prevalence in Ekiti State. The results showed that positive and linear relationships existed between the pairs of BIR indicators (ambient exposure rate, soil and water) and the prevalence of prostate and breast cancers as the Râ€“statistical values were 0.76 and 0.77 respectively. However, the p-values of the F-statistical test (0.259 and 0.275 for the pairs) were found to be higher than 0.05 at 95% confidence interval which showed that the results are not statistically significant. The study concluded that the summation of ambient exposure rate, annual effective dose equivalent of soil and water statistically did not significantly predict cancer prevalence in the study areas.

Keywords: cancer prevalence, background radiation, natural radioactivity, health and environment

## C35: INVESTIGATION OF BACKGROUND IONIZING RADIATION AT A GOLD MINE TURNED RESIDENTIAL AREA IN ILE-IFE

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Radionuclide concentration analysis of samples which include soil, plant and water collected from 4 different locations around a gold mine turned residential site in Ile-Ife were carried out using gamma spectrometry. The study aims at measuring the radionuclides specific activity concentrations and calculating radiological hazard indices in order to ascertain the level of radiological risks that the residents are exposed to.

The soil and plant samples were air dried and pulverized then weighed after which the samples were packed into special and properly sealed containers to prevent radon gas leakage. After the sealing the samples were kept for 28 days to attain secular equilibrium. The concentration of 40K, 238U, and 232Th in the samples were measured using Cesium Iodide (CsI) spectrometer and URSA software.

The Result shows high level of activity concentrations above the recommended limits for all the soil and plant samples collected from the area. Only the water samples have activity concentrations below the recommended limit. Consequently, the absorbed dose, annual effective dose and excess lifetime cancer risk are all above the recommended safe limit for all the samples except water samples. The study concluded that the residents of this reclaimed gold mine are still exposed to ionizing radiation as a result of the mining activities carried out some twenty years before the study.

## C36: INVESTIGATING RADIOACTIVITY AND RADIONUCLIDES AROUND FACULTY OF SCIENCE (WHITEHOUSE), OBAFEMI AWOLOWO UNIVERSITY, ILE-IFE, NIGERIA

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Radioactivity is a phenomenon that occurs naturally in the environment and can also be attributed to anthropogenic activities. The presence of radionuclides poses potential risks to human health and the surrounding ecosystem. This research investigates the levels of radioactivity and the distribution of radionuclides in the vicinity of the Faculty of Science (Whitehouse), Obafemi Awolowo University (OAU), Ile-Ife. Hand-held survey meter was used for ambient radioactivity measurement, while radionuclides were investigated using a CsI-based gamma spectrometry facility.

Radioactivity levels at various sampling points are analyzed, and a comparison is made with national and international standards to assess potential risks. Notably, the background radiation dose exhibited a range between 100 and 300 counts per minute, with an average of 200 counts per minute for the specific locations. The findings demonstrated that the radiation dose recorded in the sampled areas remained consistent with the background dose, deviating only in the case of an office in the Department of Geology. The elevated radiation dose in this instance was attributed to a rock sample composed of coarse grain sand with substantial grains of mafic minerals. This sample, acquired during a research endeavor from a distant location, had been placed on a shelf at the office's front, contributing to the heightened dose. This anomaly was duly addressed and rectified.

In summary, the study successfully achieved its objectives by assessing baseline radioactivity levels at the Faculty of Science of the Obafemi Awolowo University, Ile-Ife, identifying radionuclides, and comparing them with established standards.

## C37: MEASUREMENT OF RADIATION EXPOSURE RATE AROUND QUARRY SITES IN EKITI STATE, NIGERIA.

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Risk assessment monitoring remains a viable way of protecting humans from harmful ionizing radiation. This is because exposure to ionizing radiation can be deleterious to humans. In this study, the radon concentration, annual dose rate, annual effective dose and the estimated life cancer risk were obtained in and around 10 major quarry sites in Ekiti state using a digital portable survey meter detector and gamma scout. The survey meter was installed above the ground and the readings were taken at 10 different sites, neighboring offices and residential buildings for adequate comparison. The results showed that the radon concentration ranged from 1.0 Bqm-3 to 59.50 Bqm-3 with the annual dose rate varying from 0.025 mSv/y to 1.501 mSv/y and the annual effective dose from 0.060 mSv/y to 3.602 mSv/y. The mean dose rate for gamma emission varied from 0.24 Â± 0.040 to 0.455 Â± 0.045 ÂµSv/h while the annual effective dose (AED) varied from 0.438 Â± 0.070 to 0.797 Â± 0.079 mSv/y. The mean estimated life cancer risk (ELCR) on community health was 2.14 Ã— 10-3 at the quarry sites. These reported values of AED were below the maximum acceptable public exposure curtailment (ICRP, 2007) while that of ELCR was higher than the global acceptable value. Using ANOVA (at 0.05 level), no significant difference occurred in AED at the source for pulverizing, 0.5 m and 1.0 m for the blasting from the quarry sites ($p = 0.077$). Majority of the non - quarry sites and offices (used as control) had radon levels below the World Health Organization reference level and the annual effective dose except site 3. In all the sites and at the distances considered, the gamma dose rates were within the limit and pose no immediate concern to radiological health. The higher ELCR values obtained in this study suggested that long-term health impact from exposure to low-level radiation doses may become apparent in the future.

Keywords: Radiation dose, annual effective dose, ELCR, environment, air quality, radon meter and gamma scout

## C38: SURVEY AND EVALUATION OF ELECTROMAGNETIC RADIATION LEVELS AROUND MOBILE AND TELECOMMUCATION MAST IN RESIDENTIAL AREAS IN SELECTED TOWNS OF OSUN STATE

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The telecommunication sector is paramount to the social and economic development of a nation. Nigeria is Africa's largest information and communication technology (ICT) market, accounting for 82% of the continent's telecom subscribers and 29% of internet usage. The development of the telecommunication sector comes with attendant health and safety risks. The use of telecommunication devices is accompanied by the user's exposure to radiofrequency radiation (RFR), which, if significant, may produce health hazards. This study investigated the levels of exposure to electromagnetic radiation around mobile phone base stations in residential areas using a portable EMF RF Strength meter. The readings obtained were analyzed and compared with the International Commission on Non-ionizing Radiation Protection (ICNIRP) and the Institute of Electrical and Electronic Engineers (IEEE) exposure limits for radio frequency waves. The results obtained are lower than the limit set by ICNIRP indicating

that the mobile base stations pose no immediate recommended threat to the people in this study area and are th-erefore safe.

Keywords; Telecommunication, Mast, Electric Field, Magnetic Field, and Power Density

## C39: CANCER DISTRIBUTION PATTERNS OVER 5-YEAR PERIOD (2016-2020) IN EKITI STATE CANCER REGISTRY, IDO-EKITI, SOUTHWESTERN, NIGERIA

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Cancer is one of the major disease burdens worldwide and the second leading cause of death after cardiovascular disease. In Nigeria, survival rate is low due to high cost of treatment and late presentation at the hospitals. According to the 2020 World Cancer Report, prevention is the "only consideration that will credibly decrease [cancer] burden". The WHO-endorsed Asturias Declaration, further asserted that "Primary prevention - prevention of the exposures that cause cancer - is the single most effective means of prevention." This approach requires the study of the geographical spread of different cancer types to ascertain the possible contributions of environmental exposures (including local geology) together with occupational exposures.

The demographic data of 707 cancer patients spanning over a five-year period (2016-2020) were collected from the Ekiti State cancer registry situated in Federal Teaching Hospital, Ido-Ekiti (FETHI). Cancer occurrence as a function of socio-demographic variables such as cancer type, age, gender, geographical location and occupation of the subjects were studied using Excel spread sheet.

The result showed that cancer types were distributed as follows in Ekiti state: reproductive (37.2%), breast (33.5%), gastrointestinal track G.I.T. (7.1%), blood and bone marrow (3.1%), colon (3.1%), connective tissue (2.8%), skin (2.7%), metastatic (2.5%), liver and gall bladder (2.3%), brain (1.8%), endocrine (1.8%), kidney (1.6%), lungs (1.0%), lymphoma (0.8%), eye (0.7%) and jaw (0.4%). The number of male and female subjects were 264 (37.3%) and 443 (62.7%), respectively, with 53% of the female subjects presenting with breast cancer. The age at diagnosis ranged from less than one-year to 100 years with an average of 57.8 years. All the cancer of the jaw cases were in male subjects, while all the breast cancer cases were in female subjects. Similarly, more cases of cancer of reproductive sites were recorded in female (64.8 %) than in male subjects (37.2 %). The implicated age ranges from 30 to 80 years with trading being the most implicated occupation (38.6 %). The prevalence of cancer (number of cases divided by the population) ranged from 0.64 per 100,000 at Ise/Orun LGA to 15.59 per 100,000 at Ido-Osi LGA. This disparity can be due to the geology of these areas.

In conclusion, in Ekiti State, cancer occurrence is higher in females than males, the most frequent being cancer of reproductive sites. The average age of cancer patients was 57.8 years while Ido-Osi Local Government is worst hit in terms of cancer prevalence. This may be due to the underlying geology of the area.

## C40: THE POTENTIALS OF ENVIRONMENTAL ACCOUNTING IN ACHIEVING SUSTAINABLE DEVELOPMENT

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The world is becoming very crucial in concern of environmental matters. The world at large including Nigeria is at great environmental risk due to the environmental disaster. Competing land-use demands for agriculture and nature conservation is one of the most significant global challenges. To improve the health of landscapes, collaborative trans-disciplinary solutions are required.

Environmental accounting is an attractive governance approach for helping to deliver healthy future landscape. Outcome in developing countries has been limited due to diversity of approaches to environmental accounting, which makes it complex to navigate, limits trans-disciplinary collaboration and impedes implementation. This paper classifies the environmental accounting into four namely organizational environmental management accounting, organizational environmental reporting accounting, area environmental management accounting and area environmental reporting accounting. This classification is then used to discuss, across multiple scales (organizational, ecosystem and national), existing environmental accounting tools which could assist in delivering healthy future landscapes, and areas for future research.

Finally, the potential for environmental accounting research approaches (material assessment, dialogic accounting and critical accounting) to assist in defining healthy future landscapes.

Keywords: Environmental Accounting, landscape and healthy future

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