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57TH ANNUAL CONFERENCE**



**Theme: THE GEOGRAPHICAL PERSPECTIVES ON NATIONAL  
DEVELOPMENT**

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UNILAG ANG-002	Community's Assessment of Environmental Change in the Savannah Sugar Project Area in Adamawa State, Nigeria	A.S. Yahaya, A.A. Adebayo & D. Bawa	Energy, Environment and Disasters (EED)	Department of Geography; MAUTECH, Yola, Nigeria;
UNILAG ANG-003	The Effects of Ecotourism Activities on the Environment in Kamuku National Park Kaduna State, Nigeria;	Abanimun, D. Adefila, J. O. and Obeka, S. S.	Transportation and Tourism (TT)	Department of Geography ; Ahmadu Bello University, Zaria;
UNILAG ANG-004	Impact of Elevation and Nearness to Water Body on the Warming /Cooling Rates in Jimeta Town, Adamawa State, Nigeria	A.I Abdulhamed, A.I.Magaji , SU Usman, and A.K.Usman	Weather and Climate Changes (WCC)	Department of Environmental Science; Federal University, Dutse
UNILAG ANG-005	Analysis of Agricultural Development Programs in Kano State, Nigeria	Abdulkadir, H. & Abdullahi, A.	Agriculture and Food Security (AFS)	Department of Geography; Saadatu Rimi College of Education ; Kano
UNILAG ANG-006	Effect of Breaks and Dry Spell Occurrence on Moisture Effectiveness in Minna, Niger State	Abdulkadir, A., Osho P. A., Abdullahi J., Musa J., Hassan, A.B. & A. Alhassan	Weather and Climate Changes (WCC)	Department of Geography ; Federal University of Technology; Minna
UNILAG ANG-007	Farmers' Perceptions and Adaptation Strategies to Climate Change in Safana Local Government Area of Katsina State, Nigeria	Abdullahi, A., Abaje, I.B. and Jeje, O.G.	Weather and Climate Changes (WCC)	Department of Geography and Regional Planning; Federal University Dutsin-Ma;
UNILAG ANG-008	Evaluation of the Effects of Safana-Tsaskiya Road to the Surrounding Environment, Safana Local Government Katsina State	Ibrahim Abdulrashid	Land Use, Planning and Conflicts (LPC)	Department of Geography and Regional Planning; Federal University; Dutsinma



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UNILAG ANG-373	Understanding Climate Change over the Lagos Coastal Environment: What Meteorological Data Are Available and How Accessible are they?	Alabi Soneye, Mayowa Fasona, Olayinka Otusanya and M.K. Muyiolu	Weather and Climate Changes (WCC)	Department of Geography , University of Lagos, Akoka - Yaba,
UNILAG ANG-376	Application of Chemometric Analysis on Agricultural Soil in Maitumbi, Minna for Heavy Metals Source Identification	Ojache, M. Y., Animashaun, I. M., Adeoye, P. A., Kariim, I., Olorunsogo, S. T. and Salam, M. T ,	Geomorphology, Soils and Mineral Resources (GSMR),	Department of Agricultural & Bioresources Engineering, Federal University of Technology, Minna
UNILAG ANG-377	Unveiling the Nexus between Climate Change and Conflicts: A Review of Grey Literatures	Andrew Onwueleme (Ph.D.),	Weather and Climate Changes (WCC),	Social and Governance Policy Research Department, Nigerian Institute of Social and Economic Research (NISER), Ibadan
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UNILAG ANG-379	Assessment of Groundwater Quality in Saminaka Town, Lere Local Government Area, Kaduna State, Nigeria	Ali Williams Butu, Ph.D., Samaila Alhassan Sati & Atsakiya Musa Raphael	Biodiversity, Water Resources and Hydrology (BWRH)	Department of Geography , Nigerian Defence Academy, Kaduna
UNILAG ANG-380	Census Mapping and Development in Nigeria	: Onyekwelu C. A., N.O.Uluocha and A.S.O. Soneye	Mapping and Enabling Governance with Geo-Information (MEGI)	Department of Geography , University of Nigeria, Nsukka
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UNILAG ANG-383	Residential Mobility in Sabon Gari Area of Kano Metropolis	Adetunji Adetope Oloruntade,	Urban/Rural Settlements, Population and Gender Issues (SPGI)	Department of Geography , Bayero University, Kano
UNILAG	A Review of the accessible Remote	Mayowa Fasona,	Mapping and	Department of



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UNILAG ANG-408	Predicting Mobility of Cadmium (Cd) and Lead (Pb) in Contaminated Soil through a Mathematical Model	Animashaun, I. M., Olorunsogo, S. T., Otache, M. Y. I., Kuti, I. A., Abdullahi, M. B. and Ibrahim, J.,	Geomorphology, Soils and Mineral Resources (GSMR)	Department of Agricultural and Bio-resources Engineering, Federal University of Technology, Minna
UNILAG ANG-410	Assessment of Drivers' Fatigue for Policy Measures to Mitigate Road Accidents	Tata A., A. Odumosu and A. Nakura	Transportation and Tourism (TT)	Nigerian Institute of Transport Technology, Zaria
UNILAG ANG-411	Characterization of Soils Developed on Sandstone and Shale Parent Materials in Abi Environs, Cross River State, Nigeria	Essoka, P.A, J.U. Ovai and O.O. Enya	Geomorphology, Soils and Mineral Resources (GSMR)	Department of Geography and Environmental Science, University of Calabar
UNILAG ANG-412	Analysis of Location Pattern of Supermarkets in Uyo Urban, Akwa Ibom State	Ekaete Sunday Edet	Land Use, Planning and Conflicts (LPC)	Department of Geography, University of Lagos, Akoka -Yaba,
UNILAG ANG-413	Impact of Agroforestry Practices on Rural Livelihood in Gwarzo Local Government Area, Kano Nigeria	Aisha Tukur Bello	Agriculture and Food Security (AFS)	Department of Geography, Federal College of Education, Kano
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UNILAG ANG-415	Assessment of Farmers Perception and Adaptation to Climate Change: For Sustainable Agriculture in Wukari Town, Wukari Local Government Area, Taraba State, Nigeria	Kehinde T. Oyatayo, Godwin A. Songu, Abuh O. Paul, Bagula A. Johns, Jidauna G. Godswill and Christopher Ndabula	Weather and Climate Change (WCC)	Department of Geography, Kwararafa University, Wukari, Taraba State
UNILAG ANG-416	Assessing the Effective Implementation of Fieldwork in the Teaching of Geography in Senior Secondary Students in Kano, Nigeria	Nuratu Mohammed (Ph.D.)	Geography Education and Manpower (GEM)	Department of Geography, Bayero University, Kano,

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**Sub-Theme: Geomorphology, Soils and Mineral Resources (GSMR)**

## **Application of Chemometric Analysis on Agricultural Soil in Maitumbi, Minna for Heavy Metals Source Identification**

**Otache, M. Y.<sup>1</sup>, Animashaun, I. M.<sup>1</sup>, Adeoye, P. A.<sup>1</sup>, Kariim, I.<sup>2</sup>, Olorunsogo, S. T.<sup>1</sup> and Salam, M. T**

<sup>1</sup>Department of Agricultural & Bioresources Engineering, Federal University of Technology, Minna, Nigeria.

<sup>2</sup>Nanotechnology Research Group, Centre for Genetic Engineering and Biotechnology, Federal University of Technology, Minna, Nigeria

**Correspondence:** drotachemartyns@gmail.com; E-mail: martynso\_pm@futminna.edu.ng, 08032680996

### **Abstract**

Environmental pollution with toxic substances in most developing nations in recent time is of great concern because of its negative effect on soil ecosystems and its threat to food security. This study aimed at assessing the sources of heavy metals pollution in agricultural soils using chemometric analysis. Soil samples were collected and analysed for Pb, Cu, Cd, Fe, Zn, Cr, Mn, & Ni contents using Atomic Absorption Spectrophotometer and chemometrics analysis was applied on the results obtained. The mean concentrations of Zn, Ni, Pb, Cu, Mn, Cd, & Fe in the soils were 21.02, 2.60, 9.93, 17.02, 4.52, 0.94 and 784.92 mg/kg respectively. The Varimax Factors (VFs) generated showed that the soil pollution could be attributed to three sources. The first varimax factor with an eigenvalue of 2.312 accounts for 33.0% of the total variance and has high negative loading on Zn (-0.601), Mn (0.609) and Fe (0.626). This factor suggested pharmaceutical effluent as a probable source of these heavy metals in the soil. The second VF has an eigenvalue of 1.862 which explains 26.6% of the total variance and has high positive loading on Pb (0.666) and Cd (0.743). The loadings on this component indicated urban runoff as the likely source of these metals in soil. The third principal component has an eigenvalue of 1.247 which accounts for 17.8% of the total variance and has high positive loading on Cu (0.754). The loading on this component attributed source of the metal to agricultural practice. The study showed that chemometrics is a good tool for pollution source identification, which could give a guide on amelioration scheme to be adopted.

**Keywords:** Pollution sources, Pharmaceutical effluent, heavy metals, Minna