

# DAVID NARTEY OBEMAH

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Dynamic and result-driven scientist with a passion and vision for creating novel, multidisciplinary approaches to drive research and development. An expert who demonstrated the ability to apply an understanding of soil environmental science to develop new techniques using experimental design principles to increase fundamental understanding and find solutions to environmental bioremediation, climate change mitigation, soil fertility and groundwater pollution control. Excellent communication skills, adept at concisely presenting research information and proposals to all organizational levels.

## *Areas of specialization:*

Environmental Bioremediation, Greenhouse Gases and Ammonia Volatilization Quantification and Mitigation, Soil Fertility, Nutrient Cycling and Groundwater Pollution Control (Lysimeter), Biochar Production and Application, and Project Management.

## **EMPLOYMENT EXPERIENCE**

**Environmental Science Department, Kwame Nkrumah University of Science and Technology, Kumasi**

**Lecturer / Research Scientist**

2022.12 – to Date

### **Key accomplishment:**

### **Student Supervision:**

- Currently co-advising one doctoral student
- 5 Master Students advised, 15 Undergraduate Students advised, 4 masters students advising and 6 undergraduate students advising.

### **Course allocation:**

- Environmental Pollution, Environmental Toxicology, Environmental Geology, Research Methods, Chemical and Biological Oceanography, Sustainable Development: Concepts & Application, Environmental Analysis, Environmental Soil Quality.

**Council for Scientific and Industrial Research – Soil Research Institute – Soil Fertility Chemistry and Plant Nutrition Division,**

**Research Scientist**

**2021.11 – 2022.12**

- Principal coordinator for all the POLY-4 fertilizer trial sites
- POLY4 product trial on cocoa in three growing areas of Ghana
- Supervision of 2 master's student research
- Development of research proposals

### **Key accomplishment:**

- Leading the team in the establishment of cocoa field plots at the first trial at Offinso, Mabang and New Edubiase
- Developing data collection methodologies and implementation of trial protocols.

- Research is currently ongoing.

**Institute of Soil Science,  
University of Chinese Academy of Sciences.**

**2021.06 – 2022.06**

Postdoctoral Research Fellow: **Environmental Science**

- Application effect of urease inhibitors and dairy effluents on greenhouse gas and ammonia emissions and maize cultivation
- Effects of soil binding agent and effluent on nitrogen leaching and crop production

**Key accomplishment:**

- Spearheaded the establishment of field plots and lysimeter to sample greenhouse gases (GHG) and ammonia (NH<sub>3</sub>) emissions and nutrient leaching from the study of application effects of urease inhibitor and binding agents to dairy effluents on emissions and leaching from maize cultivation.
- Research is currently ongoing.

**Departments of Chemistry, Biochemistry and Biotechnology,**

**Kwame Nkrumah University of Science and Technology, Kumasi. 2014.07 – 2017.08**

**Senior Laboratory Technician**

- Conducting microbial analysis on food and several research samples, Phytochemical screening on extracts
- Preparing equipment and chemicals before lessons - from test tubes to state-of-the-art microscopes and maintaining and repairing equipment and laboratory apparatus; record-keeping, e.g. for students' practical sessions, tracking methods, results, etc., ensuring that pieces of equipment are properly cleaned, and chemicals, reagents and other materials are appropriately stored
- Ensuring that all health and safety procedures are understood and followed correctly

**Key accomplishments**

- Working with individual students and faculty supporting them in research projects
- Developing the road map to KNUST ISO 9001 Quality Management System Certification

**Lanzhou Municipal Waterworks General Cooperation, China. 2012.07 – 2012.11**

**Research Assistant (*Industrial Attachment*)**

- Determination of heavy metals in wastewater generated from some notable companies in Lanzhou, laboratory and fieldwork, and Assessment of water quality.
- Collection of pollution data on water and air.
- Prepare and submit weekly and monthly reports to the supervisor.

**Key achievements**

- Established chemical analysis techniques to analyze trace metals in water, soil, dust, and other inorganic water quality parameters. Trained laboratory technicians on these analyses.

**Asesewa Senior High School, Ghana.**

**2007.11 – 2009.09**

**Science Laboratory Technologist / Teacher**

- Teaching Chemistry, Mathematics, Preparing Laboratory for final year chemistry students practicals, Science housemaster. Writing reports and developing a termly work schedule and teaching plans and also involved in the school's extracurricular activities.

**Child's Rights International**

**2008.11 – 2009.09**

### **Community facilitator**

- Assist in program design, planning, and implementation of child rights-related activities in the Asesewa Program Area. Assist the manager in preparing a situational and quarterly report for Child Rights and Plan Ghana Offices, respectively. Assist in facilitating the most educational sessions in community and school-based activities.

### **World Education (SHAPE PROGRAM)**

**2006.10 – 2007.08**

#### **Field and Administration officer (National Service)**

- Assist in program designing, planning, and implementing key health education project activities and reporting on-field activities. Assist manager in preparing situation and quarterly reports to YPEP head and world education offices, respectively. In charge of it.

## **EDUCATION**

### **University of Chinese Academy of Sciences (UCAS)**

**Beijing, China**

Institute of Soil Science, Chinese Academy of Sciences

**Nanjing, China**

- **PhD in Soil (Environmental) Science** (Advisor Prof. Dr. Ding Weixin)  
**2017.8 – 2021.7**

Research directions: **Mitigation of field greenhouse gas and ammonia emissions, Conservation of stored effluent nutrients, and groundwater quality (lysimeter study).**

Thesis: Storage and application effect of dairy effluents on nitrogen gas emission and nitrogen leaching in upland fields

### **Lanzhou Jiaotong University**

**Lanzhou, China**

#### **School of Environmental and Municipal Engineering**

- **MEng. Environmental Science** (Advisor Prof. Zhao Baowei) **2010.9 – 2013.6**

Thesis: Preparation, characterization, and adsorptive properties of biochar derived from agricultural waste biomasses from Gansu province, china. A case study of cotton residue, cotton straw, potato residue, potato straw and swine manure.

### **Lanzhou Jiaotong University**

**Lanzhou, China**

#### **School of International Studies**

- **Chinese (Mandarin)** (Chinese Proficiency Certificate) **2009.9 – 2010.6**
- **HSK (Level 4)**

### **Kwame Nkrumah University of Science and Technology**

**Kumasi, Ghana**

#### **College of Science**

- **BSc. Chemistry** (Advisor Dr. Noah Kyame Asare-Donkor) **2002.9 – 2006.6**

Thesis: A study of the various raw materials used in the production of activated carbon in Ghana and their various uses, especially in the decolourization of methylene blue and purification of water. A case study of coconut and palm nutshells.

### **Manya Krobo Senior Secondary School**

**Odumase–Krobo, Ghana**

- **General Science**

**1999.9–2001.12**

## **CURRENT RESEARCH INTEREST:**

Biochar Production and application for Environmental Bioremediation and Sustainability, Soil fertility Management, Agricultural nutrient loss, Field greenhouse gas (GHG) and ammonia (NH<sub>3</sub>) Emissions Quantification and Mitigation, Groundwater Quality Control (lysimeter study), Nutrient Cycling, Dairy Effluent GHG and NH<sub>3</sub> mitigation strategies at Storage (Composting), and Waste Management.

## **FUNDED RESEARCH**

- ***Net-Zero Carbon Emission Project (NCEP)*** funded by Yinso Production West Africa Limited (\$350,000)
- Polyhalite (POLY-4) fertilizer blend trial at 3 (Offinso, Mabang and New Edubiase) cocoa-growing areas

## **GRANTS AND AWARDS**

- KNUST Research Fund (KReF/10/25) Multidisciplinary grant amounting to 60,000 Gh (\$5,000) – **Synergistic Use of Phosphate Fertilizer and Biochar for Gold Mine Soil Remediation in Ghana (BIOCHAR PROJECT)**
- KNUST Research Fund (KReF/10/25) Multidisciplinary grant amounting to 59,400 Gh (≈\$5,000) – **Optimisation of food waste composting with rice husk-derived biochar as an effective circular agricultural strategy in Ghana**

## **Conference support**

- Conference support from the Institute of Soil Science, Nanjing, China, to participate and present research outcomes in a virtual conference held in New Zealand

## **Academic awards**

1. Excellent International Student of the University of Chinese Academy of Sciences, UCAS (2021)
2. Nanjing Government awards for the best international student (2018, 2019, 2020)
3. 2<sup>nd</sup> best graduating Student School of Environmental and Municipal Engineering, LZJTU 2012/2013
4. 1<sup>st</sup> Best graduating student Faculty of International Affairs, LZJTU 2012/2013
5. 3<sup>rd</sup> Best Chinese Proficiency student, LJU 2009/2010 Academic year
6. 1<sup>st</sup> Best International Master's student, LJU 2010/2011 Academic year
7. China Scholarship Council (CSC) 2009–2013

## **Fellowship award**

1. CAS-TWAS President's Fellowship for PhD study in China (2017.9 – 2021.6)

## **Journal review**

Reviewer of the Journal Of Ghana Science Association, Frontiers In Sustainable Food Systems, The American Journal Of Environmental Science And Engineering (Ajese), and Scientific Reports (Springer)

## **Leadership/administrative positions held**

- Seminar and Project Coordinator, Environmental Science Department, Kwame Nkrumah University of Science and Technology, Kumasi-Ghana (2023 to date)

- Vice President: African student Association, Lanzhou Jiaotong University (Lanzhou, China) (2010–2012)
- Vice Secretary: Association of Chemistry Students (Kumasi), KNUST, Ghana (2003–2006)
- Founding member KNUST Krobo Student Union, (2004 –2005)

## **Training and development**

- African School on air quality and pollution prevention in Ghana, Organized by the Department of Meteorology and Climate Science, KNUST, Kumasi– funded by Clean Air Fund, 2025
- Enhancing Teaching and Research Through E-learning and AI Tools – funded by Professional Education for Renewable Energy in Ghana Project at the Kwame Nkrumah University of Science and Technology, Kumasi-Ghana, 2025.
- WE-AFRICA Entrepreneurial Boost Program – WE Africa Membrane Knowledge Hub, at the Kwame Nkrumah University of Science and Technology, Kumasi-Ghana, 2025.
- West African School on Air Quality and Pollution Prevention – funded by Clean Air Fund at the Kwame Nkrumah University of Science and Technology, Kumasi-Ghana, 2024.
- Life Cycle Assessment (LCA) Workshop – Building Capacity in LCA for the Achievement of Environmental Sustainability at Kwame Nkrumah University of Science and Technology, Kumasi-Ghana, 2024
- Grant Proposal Workshop for Researchers - Kwame Nkrumah University of Science and Technology, Kumasi-Ghana, 2024
- Ethics in Research Training Workshop at, Kwame Nkrumah University of Science and Technology, Kumasi-Ghana, 2024
- School on Air Quality and Pollution Prevention funded by Clean Air Fund and University of Leeds, UK at the Kwame Nkrumah University of Science and Technology, Kumasi-Ghana, 2023
- The MasterClass and Online Content Creation Training for Faculty Members funded by KNUST E-Learning Centre at the Kwame Nkrumah University of Science and Technology, Kumasi-Ghana, 2023
- Executive Leadership Development Course – funded by KNUST E-Learning Centre at the Kwame Nkrumah University of Science and Technology, Kumasi-Ghana, 2023
- Digital Literacy - by The Centre for Capacity Building and Innovation and KNUST E-Learning Centre at the Kwame Nkrumah University of Science and Technology, Kumasi-Ghana, 2023
- GLOSOLAN Webinar on Handling and Preparation of Soil Samples for Chemical and Physical Analyses – FAO - Global Soil Laboratory Network, 2021.
- The 4<sup>th</sup> Training Course (Virtual) on New Advances in Land Carbon Cycle Modelling - North Arizona University, 2021.
- Career Management for Early Career Academic Researchers - The University of Glasgow, 2021.
- Climate Change: The Science - University of Exeter, 2020.
- Presenting your research Work with Impact - University of Leeds, 2020.
- Critical Thinking at University: An Introduction - University of Leeds, 2020.
- Global perspectives and collaborations on reducing GHG emissions, 2020

- S4D4C European Science Diplomacy online Course, European Union virtual, 2020.
- IEEE Advancing Technology for Humanity, IEEE Clients Services, 2020.
- RAMIRAN Webinar Organic Materials: Maximizing the Benefits and Minimizing Risks, New Zealand, 2020.
- Winter School on Frontier and Interdisciplinary Institute of Urban Environment, Chinese Academy of Sciences (IUE-CAS), Xiamen, 2019.
- Spring School on Frontier and Interdisciplinary Science, Institute of Mountain Hazards and Environment CAS and Chengdu Institute of Biology, CAS, 2018
- NMR Basic Course and Its Application to Food Quality Workshop (2 Days), July, 2017. Organized and financed by Building Stronger Universities II(BSUII), KNUST Central LAB, Kumasi, Ghana.
- Best Practices in Grant Financial Management System Workshop (2 Days), June, 2017. Organized and financed by Building Stronger Universities II(BSUII), Research Commons, Prempeh II Library, KNUST, Kumasi, Ghana.
- Safe Water for Food Project (3 Days), 2017. Organized and financed by Building Stronger Universities II(BSUII), Research Commons, Prempeh II Library, KNUST, Kumasi, Ghana.
- Laboratory Management Workshop - Fundamentals of Laboratory Management (2 Days), November, 2016. Organized and financed by Building Stronger Universities II(BSUII), KNUST Central LAB, Kumasi, Ghana.
- Gas and Liquid Chromatography Workshop - Sample Preparation and Method Development (5 Days), November, 2016. Organized and financed by Building Stronger Universities II(BSUII), KNUST Central LAB, Kumasi, Ghana.
- Atomic Absorption Spectrometry training Workshop (3 Days), October, 2016. Organized and financed by Building Stronger Universities II(BSUII), KNUST Central LAB, Kumasi, Ghana.
- 7 Day Workshop on Data Management (including Statistical Analysis), August, 2016, Huawei ICT Laboratory, College of Science, KNUST, Ghana.
- GC-MS Workshop on Gas chromatography sample preparations and analyses, Department of Chemistry, KNUST, Ghana June, 2016.

## **LANGUAGE SKILLS**

- English (Very proficient: oral, written)
- Mandarin (Proficient: oral, written, HSK4)
- French (Basic: oral only)

## **Membership in Professional Associations**

- Ghana Young Academy
- Soil Science Society of Ghana,
- Ghana Science Association,
- Jiangsu Soil Science Society, China,
- PECB Quality Management System Practitioners,
- Organization of African Academic Doctors (O-AAD)

## CERTIFICATES

- 204 Basics of Subnational Greenhouse Gas Accounting by Greenhouse Gas Management Institute, SUBEX065.
- 202 Basics of Project Level Greenhouse Gas Accounting by Greenhouse Gas Management Institute, 202EX868.
- 501 IPCC: Introduction to Cross-Cutting Issues by Greenhouse Gas Management Institute, 501EX1743.
- Certified Lead Auditor ISO 9001:2015, Quality Management System (QMS), Professional Evaluation and Certification Board (PECB), Canada.

## Peer-Reviewed Publications

- Nartey, O. D.,** Liu, D., Luo, J., Lindsey, S., Chen, Z., Yuan, J., Zaman, M., Hogarh, J. N., Ding, W., **2024.** Optimizing application of dairy effluent with synthetic N fertilizer reduced nitrogen leaching in clay loam soil. *Heliyon* **10**, 33900–33915.
- A. I. Gabasawa, G. A. Abubakar, and **D. N. Obemah.,** 2024. Soil regeneration and microbial community on terrestrial food chain. Prospects for soil regeneration and its impact on environmental protection. Springer, 243 – 267.
- G. A. Abubakar, A. I. Gabasawa, L. A. Sale, and **D. N. Obemah.,** 2024. Advantages and disadvantages of soil regeneration. Prospects for soil regeneration and its impact on environmental protection. Springer, 297 – 305.
- Nartey, O. D.,** Liu, D., Uwamungu, Y. J., Luo, J., Lindsey, S., Di, J. H., Chen, Z., Yuan, J., Ding, W. (2021) Corn cobs efficiently reduced ammonia volatilization and improved nutrient value of stored dairy effluents. *Science of The Total Environment*, 769, 144712–144722.
- Nartey, O. D.,** Liu, D., Luo, J., Lindsey, S., Di, J. H., Chen, Z., Yuan, J., He, T., Ding, W. (2021) Optimizing the application of dairy farm effluent and manure to mitigate gas emission. *Journal of Soils and Sediments*, 21, 2935–2948.
- Uwamungu, Y. J., **Nartey, O. D.,** Uwimpye, F., Dong, W., Hu, C. (2019) Evaluating biochar impact on topsoil adsorption behavior on soil under no-tillage and rotary tillage treatments: isotherms and kinetics. *International Journal of Environmental Research and Public Health*, 16, 5034–5051.
- Zhao, B., and **Nartey, O. D.** (2015) Adsorption of Pb(II) onto biochars derived from biomasses originated from Loess soil areas. *International Journal of Applied Environmental Sciences (IJAES)*, 10(1), 239–248.
- Zhan, H., Jiang, Y., Yuan, J., Hu, X., **Nartey, O. D.,** Wang, B. (2014) Trace Metal pollution in soil and wild plants from lead-Zinc smelting areas in Huixian County, North-western China. *Journal of Geochemical Exploration*, 147, 182–188.
- Nartey, O. D.,** and Zhao, B. (2014) Biochar preparation, characterization, adsorptive capacity and its effect on bioavailability of contaminants. An Overview. *Advances in Materials Science and Engineering*, 147, 715398–715410.
- Nartey, O. D.,** and Zhao, B. (2013) Adsorption of Pb(II) from aqueous solution onto biochar prepared from cotton residue. *Journal of Lanzhou Jiaotong University*, 32, 159–169.
- Zhao, B., Li, Z., **Nartey, O. D.,** Li, R. (2013) Adsorption characteristics of Cu<sup>2+</sup> on natural zeolite from Bayin, China. *Asian Journal of Chemistry* 25, 3161–3166.
- Zhong, J., Zhao, B., Zhu, K., Ran, J., **Nartey, O. D.** (2013) Interaction between Phenol and Cupric ion sorption on natural loess. *Fresenius Environmental Bulletin*, 22(11), 3132–3139.

- Zhao, B., Ma, F., **Nartey, O. D.**, Ma, T., Li, W. (2012) Influence of type and concentration of surfactant on biodegradation of phenanthrene in an aqueous solution. *Fresenius Environmental Bulletin*, 21, 830–837.
- Zhong, J., Zhao, B., Zhu, K., Ma, F., Ran, J., **Nartey, O. D.** (2011) Solubilization kinetics of phenanthrene by surfactants and relationship between weight solubilization ratio (WSR) and hydrophile-lipophile balance value (HLB) of surfactants. *Environmental Chemistry*, 30, 10–19.
- Zhong, J., Zhao, B., Zhu, K., Ma, F., Ran, J., **Nartey, O. D.** (2011) The interaction between phenanthrene and Cu<sup>2+</sup> sorption on dark Loessial soil. *Journal of Agro-Environmental Science*, 20, 1985–1990.
- Yan, Z., Zhang, G., Yang, J., **Nartey, O. D.**, Xie, Z. (2011) Influence factors and mechanism of removing fluorides with Fe-Type sepiolites. *Water Resource and Environmental Protection*, 4, 2955–2958.

### **Manuscripts in preparations**

- Nartey, O. D.**, Liu, D., Luo, J., Lindsey, S., Di, J. H., Ding, W. (2021). Effluent split application reduced yield-scaled N<sub>2</sub>O and NO emissions in a wheat-maize rotation system.
- Nartey, O. D.**, Liu, D., Luo, J., Lindsey, S., Di, J. H., Ding, W. (2021). Effect of inhibitors and lactic acid on ammonia volatilization, greenhouse gases emissions and nutrient value of stored dairy effluent.

### **Abstracts presented at conferences**

- Nartey, O. D.**, Michael Quist, Tasala Kasimu, Benedicta Nyakor, Christian Nartey. Assessment of mercury and cyanide levels in backyard gardens at Akaporiso, Obuasi-Ghana (2024). *Ghana Science Association* (Poster Presentation ODN).
- Nartey, O. D.**, Isaac Sakyi Akomah (2024). Evaluating the effectiveness of maturation ponds in wastewater stabilization pond: A case study of Diawuoso-Obuasi Ghana. *Ghana Science Association* (Poster Presentation ODN).
- Nartey, O. D.**, Liu, D., Luo, J., Lindsey, S., Di, J. H., Ding, W. (2020). Corn cobs efficiently reduced ammonia volatilization and improved nutrient value of stored dairy effluents. *New Zealand-China Water Research Centre Workshop Programme* (Oral Presentation ODN).
- Nartey, O. D.**, Zhao, B. (2014). Characterization and evaluation of biochars derived from agricultural waste biomass from Gansu, China. *Advances in Civil, Environmental and Material Research* (ACEM14) (Poster presentation by ODN).
- Nartey, O. D.** (2015). Adsorption of Pb (II) from aqueous solutions onto biochar prepared from cotton residue in Northern China. *15<sup>th</sup> International Conference on Environmental Science and Technology, (1010RJA070)*. (Oral presentation ODN).
- Nartey, O. D.**, Yan, Z., Zhang, G., Yang, J., Xie, Z. (2011). International symposium on water Resource and Environment Protection, Xian, Shanxi Province, China. 2012. *International Symposium on Geometric for Interested Water Resource Management, Lanzhou, Gansu Province, China*. (Poster presentation by ODN).

### **Master's supervision**

- Assessing the efficiency of the Obuasi (Diawuoso) wastewater stabilization pond.
- Air pollution: A bibliometric analysis of the current state of research in West Africa.
- Assessing the level of contamination of mechanised boreholes in some selected communities in the Kwahu West municipality, Ghana.



## **Undergraduate supervision**

- Synergistic effects of biochar and compost on reducing heavy metal accumulation in lettuce.
- Effect of biochar and inorganic fertiliser on bioaccumulation of heavy metals in lettuce.
- Effect of combined application of compost and biochar on remediating soil heavy metal pollution and lettuce quality.
- Evaluating the effectiveness of biochar in reducing pathogenic bacteria in poultry litter; through composting.
- Nutrient Content and Quality Assessment of Water Hyacinth (*Eichhornia crassipes*).
- Bioavailability and bioaccessibility of potentially toxic elements from mine soil in Sanso, Obuasi.
- Preparation, characterization and evaluation of endocarp of *prunus dulcis* l-derived biochar for bioremediation and soil fertility enhancement.
- Assessing the impact of *prunus dulcis* l-derived biochar quantity on heavy metal remediation in mining-tailing contaminated soil in Obuasi, Ghana.
- Assessment of mercury and cyanide levels in backyard gardens at Obuasi (akaporiso) Ghana.
- Impact of effluent from facultative stabilization ponds on soil health and crop quality. a case study in Obuasi (Diawuoso), Ghana.
- Assessing residual pollution and its impact on crop cultivation in soil 44 years after gold mine tailings spillage in Obuasi, Ghana.
- Assessment of effluent suitability from facultative stabilization ponds for irrigation purposes in Obuasi (Diawuoso), Ghana.

## **Workstyle**

- Willing to perform basic tasks and move on to solve complex problems
- Able to learn new knowledge and adapt to new environments quickly
- Strong independent work style and excellent teamwork skills
- Well-organized and passionate

## **Laboratory instrumentation/analysis**

- Gas Chromatography, NO<sub>x</sub> Analyzer, NH<sub>3</sub> sampling, Mass Spectrometry, Flame Photometer, NanoDrop, Spectrophotometer, HPLC, Atomic absorption Spectroscopy (AAS), Gravimetric Analysis, Volumetric Analysis, Fourier Transform infrared spectroscopy (FTIR), Scanning Electron Microscopy (SEM), X-Ray Diffraction (XRD), and Brunner Emmet and Teller (BET), pH meter, and conductivity meter.

## **Other skills**

- Analytical, Team Player, Good Planner, Good Communicator, Good Organizer, Good Decision Making, Problem Solving, Project Management, Presentation skills and Reliable.

## **References**

Provided upon request