Wajid Umar (Ph.D.)

Phone: (+49) 01745965211 (Mobile) | **Email:** wumar@atb-potsdam.de | **Website:** https://wajidumar.com | **Twitter:** https://twitter.com/Wajidumar007 |

Whatsapp Messenger: +491745965211 |

Address: Max-Eyth-Allee 100, 14469, Potsdam, Germany (Work)

WORK EXPERIENCE

LEIBNIZ INSTITUTE FOR AGRICULTURAL ENGINEERING AND BIOECONOMY – POTSDAM, GERMANY

Business or Sector Agriculture, forestry and fishing | **Department** Technology assessment |

Address Max-Eyth-Allee 100, Potsdam, Germany, 14469, Potsdam, Germany | **Email** wumar@atb-potsdam.de |

Website https://atb-potsdam.de/

RESEARCH SCIENTIST – 30/05/2023 – CURRENT

Project 1: EcoNutri (Innovative concepts and technologies for ecologically sustainable nutrient management in agriculture aiming to prevent, mitigate, and eliminate pollution in soils, water, and air).
Project 2: NUTRITIVE (Innovative Decision Making Tool for Defining the Most Suitable Manure Management Strategies to Achieve a Sustainable Livestock Farming System During the Whole Value Chain)
Roles:
Project management
Research management
Data collection
Data analysis
Report preparations
Scientific publications
Results dissemination (Conferences, workshops)

LEIBNIZ INSTITUTE FOR AGRICULTURAL ENGINEERING AND BIOECONOMY – POTSDAM, GERMANY

Business or Sector Agriculture, forestry and fishing | **Department** Technology assessment | **Email** wumar@atb-potsdam.de |

Website https://atb-potsdam.de/

RESEARCHER – 01/02/2023 – 31/03/2023

Project: MELS *(Reduction of greenhouse gas emissions from livestock systems)*

My duties included:

- Evaluation of the emission factors and mitigation options of ammonia and GHG in agriculture.
- Modeling on NH_3 and GHG emission factor data from DATAMAN Database (Poultry production)
- Writing scientific articles.
- Completion of project reports.

REVISION OF THE UNECE AMMONIA GUIDANCE DOCUMENT

15/11/2023 – CURRENT

Options for Ammonia Abatement: Guidance from the UNECE Task Force on Reactive Nitrogen

The Ammonia Guidance Document is meant as a ***state-of-the-art reference document for preventing and abating ammonia emissions from agricultural sources***, to be used primarily by policymakers, those in industry, and scientists.
The Ammonia Guidance Document is an important document when it comes to policymaking for NH_3 mitigation from the agriculture sector in Europe. It is one of the parts of the Gothenburg Protocol and it was first approved by the commission in 2014. It is published under the umbrella of the United Nations Economic Commission for Europe.
Its revision started on 15 November 2023 and I am part of the committee of scientists involved in its revision. I am also contributing as an author in two chapters of this Guidance Document.
The NH_3 Guidance Document published in 2014 can be accessed on the link given below.

Link https://www.clrtap-tfrn.org/content/options-ammonia-abatement-guidance-unece-task-force-reactive-nitrogen

EDUCATION AND TRAINING

31/08/2018 – 20/01/2023 Godollo, Hungary

DOCTOR OF PHILOSOPHY- ENVIRONMENTAL SCIENCE (AGROCHEMISTRY) Hungarian University of Agriculture and Life Sciences

Address Godollo, pater karoly utca 1, 2100, Godollo, Hungary | **Website** https://godollo.uni-mate.hu/en

31/08/2015 – 10/08/2017 Faisalabad, Pakistan

MSC (HONS) AGRICULTURAL-SOIL SCIENCE (CGPA: 3.93/4.00) University of Agriculture Faisalabad

Address Jail Road, 38000, Faisalabad, Pakistan | **Website** www.uaf.edu.pk

31/08/2011 – 15/07/2015 Faisalabad, Pakistan

BSC (HONS) AGRICULTURE (MAJOR: SOIL SCIENCE) (CGPA: 3.80/4.00) University of Agriculture Faisalabad

Address Jail Road, 38000, Faisalabad, Pakistan | **Website** www.uaf.edu.pk

PROJECTS

30/05/2023 – CURRENT

EcoNutri (Innovative concepts and technologies for ecologically sustainable nutrient management in agriculture aiming to prevent, mitigate and eliminate pollution in soils, water, and air)

ECONUTRI is an Innovation Action project based on a multi-actor approach which includes scientific experts in public institutions, private companies, farmers' associations, and reaches out to various stakeholders (with expressed interest). In summary, the aim of ECONUTRI is to optimize and validate at commercial level nutrient management technologies that minimize or even eliminate nitrogen (N) and phosphorus (P) pollution by limiting N emissions to soil, water and air and P emissions to water resources. Such a challenge follows the EU's Green Deal having as a target to contribute to reduction of nutrient losses by 50% that can lead to a reduction of at least 20% in fertilizer use up to 2030 to the benefit of the farmers and the environment. ECONUTRI is partnering with six Chinese institutions to complement activities between EU and China and strengthen the scientific and technological ties.

Link https://econutri-project.eu/

01/06/2024 – CURRENT

NUTRITIVE (INNOVATIVE DECISION-MAKING TOOL FOR DEFINING THE MOST SUITABLE MANURE MANAGEMENT STRATEGIES TO ACHIEVE A SUSTAINABLE LIVESTOCK FARMING SYSTEM DURING THE WHOLE VALUE CHAIN)

The main objective of NUTRITIVE is to develop a decision-making tool (DSS, decision support system) able to define the most efficient and sustainable manure management strategy for a given livestock farm. Based on three pillars (environmental, economic, and social) it will limit manure air emissions as well as soil and water contaminants. This will allow for the formulation of technical guidelines and recommendations that will support policy makers with enhanced knowledge to establish requirements for future European policies.

Link https://nutritive.es/

01/01/2020 – 31/03/2023

MELS (Reduction of greenhouse gas emissions from livestock systems)

The MELS project builds on the DATAMAN project of the Global Research Alliance. Additional data on emissions from manure management as well as activity and additional data are collected in MELS. The data will be used to establish functional relationships between emissions and activity/ancillary variables, allowing for refinement of national inventories and a better assessment of the cost-effectiveness of a range of mitigation measures. MELS will assess existing systems to support on-farm decision-making related to greenhouse gas emissions from animal production systems, including grazing ruminants, and recommend improvements.

Link https://www.mels-project.eu/

PROJECT PROPOSAL WRITING

NUTRITIVE(Innovative decision-making tool for defining the most suitable manure management strategies to achieve a sustainable livestock farming system during the whole value chain)

Status: Funded

SKILLS

Programming languages

Python programming | R progamming | R / R Studio / R Markdown

Modeling

Machine Learning | Generalized Linear Mixed Models | Meta-analysis | Linear Mixed Effect Models

Data analysis/Statistical analysis

Github | Rstudio- Regression Analysis | Data Analysis (Inferential Statistics, T-Test, Correlation Coefficient) | Data analysis (hypothesis testing, ANOVA, multivariate analysis) | Data Visualization

General

Microsoft Office: proficient user of Word, Excel and Powerpoint | Data Science | Data Collection, Data Processing, Data Analysis, Data Visualisation

HONOURS AND AWARDS

31/08/2018
Stipendium Hungaricum Scholarship for PhD

Awarded by: Hungarian Government

31/08/2016
Innovative Research award during master's studies

Awarded by: US center of Advanced Studies in Agriculture and Food Security (USPCAS-AFS)

31/08/2011
Merit Scholarship during bachelor's studies

Awarded by: University of Agriculture Faisalabad
From 2011-2015

31/01/2016
Prime Minister laptop award

Awarded by: Government of Pakistan

VOLUNTEERING

29/02/2020 – CURRENT
Reviewer

Working as a reviewer for several well-reputed journals like Toxicology and Environmental Safety, Soils and Sediments, Plant Growth Regulators, European Journal of Soil Science, etc.

01/05/2020 – 30/04/2022 Hungary
HOOK Student Mentor

Worked as a mentor for international students coming to Hungary under the HOOK mentoring program.

LANGUAGE SKILLS

Mother tongue(s): **URDU**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C1	C1	C1	C1	C1
GERMAN	A1	A1	A1	A1	A1

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user

CONFERENCES & SEMINARS

24/09/2024 – 26/09/2024 Valencia, Spain
International Symposium on Gas and Dust Emissions from Livestock (EmiLi)

Experimental investigation of a low-cost online monitoring tool to manage barn climate and emissions from livestock housing systems

Link https://emiliconference.com/

12/09/2023 – 14/09/2023 Cambridge, UK
18th International RAMIRAN Conference (Managing organic resources in a changing environment)

Presentation: A wireless sensor network for low-cost monitoring of emissions

Link https://ramiran2023.org/

23/10/2022 – 28/10/2022 Madrid, Spain
N Workshop Madrid (Halving the N Waste by 2030)

Link https://nworkshop.org/

15/02/2020 – 20/02/2020 Vodice, Croatia
55th Croatian and 15th International Symposium on Agriculture, February 16-21, Vodice, Croatia

04/04/2017 – 06/04/2017 University of Agriculture Faisalabad, Pakistan
Advances in agricultural resource management-ICARM

18/12/2016 – 20/12/2016 Department of Soil Science, UCA and ES, The Islamia University of Bahawalpur, Pakistan
1st International Salinity Conference (ISC)

07/12/2016 – 09/12/2016 Pakistan Agricultural Scientists Forum. The University of Haripur, Haripur, Pakistan
Conference on Sustainable Crop and Animal Production Systems

PUBLICATIONS

2025
Acidification of animal slurry in housing and during storage to reduce NH3 and GHG emissions-recent advancements and future perspectives

Wajid Umar, Chari Vandenbussche, Elio Dinuccio, Dong Hongmin, Barbara Amon. 2025. Acidification of animal slurry in housing and during storage to reduce NH3 and GHG emissions-recent advancements and future perspectives.Waste Management

Journal Name: Waste Management | **Publisher**: Elsvier

2024
Nitrogen fertilizers and the future of sustainable agriculture: a deep dive into production, pollution, and mitigation measures

Write here Tufail, M. A., Ayyub, M., Tariq, L., Iltaf, J., Asbat, A., Bashir, I., & Umar, W. (2024). Nitrogen fertilizers and the future of sustainable agriculture: a deep dive into production, pollution, and mitigation measures. *Soil Science and Plant Nutrition*, 1–21. https://doi.org/10.1080/00380768.2024.2361068the description...

2023

Reduction of nitrous oxide emission by using stearic acid combined zinc coated urea in silty clay and sandy loam soils under bare and planted conditions

Umar, W., Balogh, J., Hameed, M. K., Ayub, M. A., Anwaar, M. H., Czinkota, I., & Gulyás, M. (2023). Reduction of nitrous oxide emission by using stearic acid combined zinc coated urea in silty clay and sandy loam soils under bare and planted conditions. Heliyon, 9(12).

2022

Development and characterization of slow release N and Zn fertilizer by coating urea with Zn fortified nano-bentonite and ZnO NPs using various binders

W. Umar, I. Czinkota, M. Gulyás et al., Development and characterization of slow release N and Zn fertilizer by coating urea with Zn fortified nano-bentonite and ZnO NPs using various binders. Environmental Technology & Innovation **(2022),** doi:https://doi.org/10.1016/j.eti.2021.102250.

2023

Mediation of gaseous emissions and improving plant productivity by DCD and DMPP nitrification inhibitors: Meta-analysis of last three decades

Tufail, M.A., Irfan, M., Umar, W. *et al.* Mediation of gaseous emissions and improving plant productivity by DCD and DMPP nitrification inhibitors: Meta-analysis of last three decades. *Environ Sci Pollut Res* (2023). https://doi.org/10.1007/s11356-023-26318-5

2022

Differential Metabolic Responses of Lettuce Grown in Soil, Substrate and Hydroponic Cultivation Systems under NH4+/NO3− Application

Hameed, M.K.; **Umar, W**.; Razzaq, A.; Aziz, T.; Maqsood, M.A.; Wei, S.; Niu, Q.; Huang, D.; Chang, L. Differential Metabolic Responses of Lettuce Grown in Soil, Substrate and Hydroponic Cultivation Systems under NH_4^+/NO_3^- Application. *Metabolites* **2022**, *12*, 444. https://doi.org/10.3390/metabo12050444

2020

Nitrogen and Phosphorus Use Efficiency in Agroecosystems

Umar, W., Ayub, M. A., ur Rehman, M. Z., Ahmad, H. R., Farooqi, Z. U. R., Shahzad, A., ... & Nadeem, M. (2020). Nitrogen and phosphorus use efficiency in agroecosystems. In *Resources Use Efficiency in Agriculture* (pp. 213-257). Springer, Singapore.

2022

Learning from natural sediments to tackle microplastics challenges: A multidisciplinary perspective

Waldschläger, K., Brückner, M. Z., Almroth, B. C., Hackney, C. R., Adyel, T. M., Alimi, S. O., ... & Wu, N. (2022). Learning from natural sediments to tackle microplastics challenges: A multidisciplinary perspective. *Earth-Science Reviews*, 104021.

2020

Synthesis, characterization and application of ZnO nanoparticles for improved growth and Zn biofortification in maize

Umar, W., Hameed, M. K., Aziz, T., Maqsood, M. A., Bilal, H. M., & Rasheed, N. (2020). Synthesis, characterization and application of ZnO nanoparticles for improved growth and Zn biofortification in maize. *Archives of Agronomy and Soil Science*, 1-13.

2023

Quantification of total polyphenols, antioxidants, anthocyanin and secondary metabolites by UPLC VION IMS QTOF MS/MS analysis in green and red lettuce cultivars

Hameed, M.K., Umar, W., Razzaq, A., Wei, S., Niu, Q., Huang, D., Chang, L. (2023). Quantification of total polyphenols, antioxidants, anthocyanin and secondary metabolites by UPLC VION IMS QTOF MS/MS analysis in green and red lettuce cultivars, Scientia Horticulturae, Volume 315, 2023, 111994.

2023

Divergent effects of cerium oxide nanoparticles alone and in combination with cadmium on nutrient acquisition and the growth of maize (Zea mays)

Ayub, M. A., ur Rehman, M. Z., Ahmad, H. R., Rico, C. M., Abbasi, G. H., Umar, W., ... & Rossi, L. (2023). Divergent effects of cerium oxide nanoparticles alone and in combination with cadmium on nutrient acquisition and the growth of maize (Zea mays).Volume 14. https://doi.org/10.3389/fpls.2023.1151786.

2022

Recent advances in bioremediation of heavy metals and persistent organic pollutants: A review

Tufail, M. A., Iltaf, J., Zaheer, T., Tariq, L., Amir, M. B., Fatima, R., ... & Ayyub, M. (2022). Recent advances in bioremediation of heavy metals and persistent organic pollutants: A review. *Science of The Total Environment*, 157961.

2021

Accumulation, Partitioning, and Bioavailability of Micronutrients in Plants and Their Crosstalk with Phytohormones

Ayub, M. A., Ahmad, Z., **Umar, W.**, Nadeem, M., & Iftikhar, I. (2021). Accumulation, Partitioning, and Bioavailability of Micronutrients in Plants and Their Crosstalk with Phytohormones. *Plant Growth Regulators: Signalling Under Stress Conditions*, 39.

2021

Physiological mechanisms and adaptation strategies of plants under heavy metal micronutrient deficiency/toxicity conditions

Ayub, M. A., ur Rehman, M. Z., **Umar, W**., Adnan, M., Farooqi, Z. U. R., Naveed, M., ... & Ahmad, H. R. (2021). Physiological mechanisms and adaptation strategies of plants under heavy metal micronutrient deficiency/toxicity conditions. In *Frontiers in Plant-Soil Interaction* (pp. 413-458). Academic Press.

2022

Role of nanotechnology in enhancing crop production and produce quality

Muhammad Ashar Ayub, Asif Naeem, Muhammad Zia ur Rehman, Zia Ur Rahman Farooqi, Wajid Umar, Hina Fatima, Muhammad Nadeem, Muhammad Shabaan,(2022). Role of nanotechnology in enhancing crop production and produce quality, Editor(s): Janardhan Reddy Koduru, Rama Rao Karri, Nabisab Mujawar Mubarak, Erick R. Bandala, In Micro and Nano Technologies, Sustainable Nanotechnology for Environmental Remediation, Elsevier, 703-764, https://doi.org/10.1016/B978-0-12-824547-7.00014-X.

2022

Use of nanotechnology for wastewater treatment: potential applications, advantages, and limitations

Wajid Umar, Muhammad Zia ur Rehman, Muhammad Umair, Muhammad Ashar Ayub, Asif Naeem, Muhammad Rizwan, Husnain Zia, Rama Rao Karri (2022). Use of nanotechnology for wastewater treatment: potential applications, advantages, and limitations, Editor(s): Janardhan Reddy Koduru, Rama Rao Karri, Nabisab Mujawar Mubarak, Erick R. Bandala. In Micro and Nano Technologies, Sustainable Nanotechnology for Environmental Remediation, Elsevier. 223-272, https://doi.org/10.1016/B978-0-12-824547-7.00002-3.

2020

Precision Agriculture to Ensure Sustainable Land Use for the Future: Precision Agriculture and Arable Land Use

Farooqi, Z. U. R., Ayub, M. A., Nadeem, M., Shabaan, M., Ahmad, Z., Umar, W., & Iftikhar, I. (2021). Precision agriculture to ensure sustainable land use for the future: precision agriculture and arable land use. In *Examining International Land Use Policies, Changes, and Conflicts* (pp. 210-230). IGI Global.

DOI: 10.4018/978-1-6684-5352-0.ch068

2021
Sufficiency and toxicity limits of metallic oxide nanoparticles in the biosphere

Sohail, M. I., Ayub, M. A., ur Rehman, M. Z., Azhar, M., Farooqi, Z. U. R., Siddiqui, A., ... & Fatima, H. (2021). Sufficiency and toxicity limits of metallic oxide nanoparticles in the biosphere. In *Nanomaterials: Synthesis, Characterization, Hazards and Safety* (pp. 145-221). Elsevier.

2021
Microbial associations in ecological reclamation and restoration of marginal lands

Zia, H., Ayub, M. A., El Baroudy, A. A. E. F., ur Rehman, M. Z., Khalid, H., ul Haq, A., ... & Ahmad, Z. (2021). Microbial associations in ecological reclamation and restoration of marginal lands. In *Microbes in Land Use Change Management* (pp. 239-266). Elsevier.

2020
Threats to Arable Land of the World: Current and Future Perspectives of Land Use

Farooqi, Z. U. R., Ahmad, Z., Ayub, M. A., Umar, W., Nadeem, M., Fatima, H., ... & Ashraf, M. I. (2021). Threats to Arable Land of the World: Current and Future Perspectives of Land Use. *Examining International Land Use Policies, Changes, and Conflicts*, 186-209.

2020
Role of Urban Vegetation: Urban Forestry in Micro-Climate Pollution Management

Ayub, M. A., Farooqi, Z. U. R., Umar, W., Nadeem, M., Ahmad, Z., Fatima, H., ... & Anjum, M. Z. (2021). Role of Urban Vegetation: Urban Forestry in Micro-Climate Pollution Management. In *Examining International Land Use Policies, Changes, and Conflicts* (pp. 231-251). IGI Global.

2020
Google Earth Engine-Based Visual/Qualitative Investigation on Urbanization: Quick Urban Sprawl Visualization in Beijing, China

Ayub, M. A., Farooqi, Z. U. R., Umar, W., Nadeem, M., Ali, T., Fatima, H., ... & Arshad, M. N. (2021). Google Earth Engine-Based Visual/Qualitative Investigation on Urbanization: Quick Urban Sprawl Visualization in Beijing, China. In *Examining International Land Use Policies, Changes, and Conflicts* (pp. 125-138). IGI Global.

2015
Assessment of water quality for drinking purpose from water coolers of different teaching institutes in Lahore

Asif, S., Sajjad, N., Sheikh, A. A., Shahzad, M., Munir, M. T., Umar, W., & Umar, S. (2015). Assessment of water quality for drinking purpose from water coolers of different teaching institutes in Lahore. *IOSR Journal of Environmental Science, Toxicology, and Food Technology*, *9*(2), 18-22.

UPCOMING PUBLICATIONS

Quantification of practices' effects on greenhouse gas and ammonia emission factors from livestock housing using the global DATAMAN database

To be submitted to the Biosystems Engineering

Analysis of a global data collation on cattle and swine housing: effects of environmental and housing system factors on ammonia and greenhouse gas emissions factors

Drafting stage

Analysis of a global data collation on cattle and swine manure storage: effects of environmental and storage system factors on ammonia and greenhouse gas emissions factors