

MUHAMMAD NAFEES

Personal Information:

Date of Birth: 24th November, 1990
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Education

- Ph.D. Environmental Sciences (2018-2025) from Nanjing University, Nanjing, Jiangsu, China. (**Duration extended due to COVID-19**)
 - **Thesis title:** Toxic impact and mitigation strategies of combined contamination by sulfadiazine, heavy metals, and microplastics on different plants.
- M.Sc. (Hons) Environmental Sciences (2013-2015) from University of Agriculture, Faisalabad, Pakistan.
 - **Thesis title:** Potency of Biogas slurry and *Burkholderia phytofirmans* PsJN to improve physiology and growth of Brassica in Cr contaminated soil.
- BS (Hons) Environmental sciences in 2012 from Govt. College University, Faisalabad, Pakistan.
- FSc (Pre-Medical) in 2008 from Board of Intermediate & Secondary Education Faisalabad, Pakistan.
- Matric (Science) in 2006 from Board of Intermediate & Secondary Education Faisalabad, Pakistan.

Skills

Lab Skills/Equipment:

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|----------------------------------|--|
| • Atomic absorption spectrometer | • Laminar air flow hood/cabinet |
| • Analytical balance | • Centrifugation |
| • Autoclave | • Isolation, purification and characterization of microbes |
| • Digital BOD/COD meter | • DNA Extraction |
| • Flame photometer | |
| • Spectrophotometer/Elisa | |
| • ICP-MS | |

Computing Skills:

- Microsoft Office
- SPSS
- Statix v. 8.1
- Minitab
- R & R studio
- Python

Publications

Corresponding Author Research Papers:

1. Bushra Maryam, **Muhammad Nafees**, Suneela Raza, Farooq Ahmad Khan Laghari, Anosha Sultan. 2025. Climate Change in Pakistan: Assessing Risks, Adaption and Mitigation Strategies. *Journal of Climate and Community Development*, 4(1): 368-383.

First Author Research Papers:

1. **Muhammad Nafees**, Linlin Qiu, Sarah Owdah Alomrani, Zulfiqar Ahmad, Ying Yin, Al Hashedi Sallah A., Mohammad Ali Alshehri, Shafaqat Ali, Hongyan Guo. 2025. Enhancing spinach growth and soil microbial health under sulfadiazine and polypropylene exposure through zinc fortification. *Environmental Technology & Innovation*. 104186.
2. **Muhammad Nafees**, Adiba Khan Sehrish, Sarah Owdah Alomrani, Linlin Qiu, Aasim Saeed, Shoaib Ahmad, Shafaqat Ali, Hongyan Guo. 2024. Mechanism and synergistic effect of sulfadiazine (SDZ) and cadmium toxicity in spinach (*Spinacia oleracea* L.) and its alleviation through zinc fortification. *Journal of Hazardous Materials*, 464, 132903.
3. **Muhammad Nafees**, Muhammad Azhar Ali, Linlin Qiu, Ying Yin, Meiling Xu, Guobing Wang, Shafaqat Ali, Hongyan Guo. 2024. Mechanistic approach of tannery wastewater and sulfadiazine mutual toxicity in wheat (*Triticum aestivum* L.) and mitigation through exogenous application of gallic acid. *Chemosphere*. 358, 142203.
4. **Muhammad Nafees**, Shafaqat Ali, Muhammad Naveed, Muhammad Rizwan 2018. Efficiency of biogas slurry and Burkholderia phytofirmans PsJN to improve growth, physiology, and antioxidant activity of *Brassica napus* L. in chromium-contaminated soil. *Environmental Science and Pollution Research*. 25:6387–6397.
5. **Muhammad Nafees**, Linlin Qiu, Sarah Owdah Alomrani, Aasim Saeed, Ying Yin, Mohammad Ali Alshehri, Shafaqat Ali, Hongyan Guo. Understanding the combined impact of sulfadiazine and polystyrene on *Brassica napus* L. and soil microbial community: Improvement through TiO₂ foliar application. *Environmental Science: Nano* (Under Review).

Co-author Research Papers:

1. Younas, M., **Nafees, M.**, Gafoor, A., Alomrani, S.O., Alasmari, A., Tahir, M., Adrees, M., Ali, S. 2026. A comprehensive approach to ameliorate the solo and mutual toxicity of cadmium and tetracycline antibiotics in maize (*Zea mays* L.) crop through nutritional spray of Ca-Mg nanocomposite. *Journal of Chemistry*, 12: 9417190
2. Qiu, L., Niu, L., **Nafees, M.**, Zhou, S., Wu, W., Du, J., Zhou, Q., Jin, M., Guo, H. 2025. Mechanisms for sulfadiazine effective mitigation in biochar-amended soil: From antibiotic resistance to soil microbial community composition and function. *Journal of Environmental Management*, 386, 125702.
3. Qiu, L., Daniell, T.M, **Nafees, M.**, Chen, Y., Zhou, S., Wu, W., Du, J., Zhou, Q., Jin, M., Ji, W., Ge, J., Guo, H. 2025. Biochar-induced strong microbial carbon limitation prompts organic carbon sequestration and plant growth in antibiotic-contaminated soil. *Plant and soil*, 1-7.
4. Ali, M.A., **Nafees, M.**, Waseem, M., Alomrani, S.O., Al-Ghanim, K.A., Alshehri, M.A., Zheng, H., Ali, S., 2024. Modulation of Cd carriers by innovative

- nanocomposite (Ca+Mg) and Cd-resistance microbes (*Bacillus pumilus*): a mechanistic approach to enhance growth and yield of rice (*Oryza sativa* L.). *Frontiers in Plant Science*, 15:1387187
5. Ali, M.A., **Nafees, M.**, Alomrani, S.O., Li, Y., Wang, Q., Alshehri, M.A., Al-Ghanim, K.A., Ali, S., Zheng, H., 2024. Noval nanocomposite and biochar insights to boost rice growth and alleviation of Cd toxicity. *Scientific Reports*, 14:23158.
 6. Younis, M., **Nafees, M.**, Munir, M., Almorani, S.O., Waseem, M., Alshehri, M.A., Sarker, P.B., Ali, S., 2025. Cadmium resistance microbes and TiO₂ nanoparticles alleviate cadmium toxicity in wheat. *Scientific Reports*, 15, 5557.
 7. Linlin Qiu, Jingjing Wu, Wenchao Du, **Muhammad Nafees**, Ying Yin, Rong Ji, Steven A. Banwart, Hongyan Guo 2021. Response of soil bacterial communities to sulfadiazine present in manure: Protection and adaptation mechanisms of extracellular polymeric substances. *Journal of Hazardous Materials* 408, 124887.
 8. Linlin Qiu, J Wu, Y Qian, **M Nafees**, J Zhang, W Du, Y Yin, H Guo 2021. Impact of biochar-induced vertical mobilization of dissolved organic matter, sulfamethazine and antibiotic resistance genes variation in a soil-plant system. *Journal of Hazardous Materials* 417, 126022.
 9. L Qiu, TJ Daniell, SA Banwart, **M Nafees**, J Wu, W Du, Y Yin, H Guo 2021. Insights into the mechanism of the interference of sulfadiazine on soil microbial community and function. *Journal of Hazardous Materials*, 126388.
 10. Ahmad, S., Mfarrej, MFB., El-Esawi, MA., Waseem, M., Alatawi, A., **Nafees, M.**, Saleem, MH., Rizwan, M., Yasmeen, T., Anayat, A., Ali, Shafaqat. 2022. Chromium-resistant *Staphylococcus aureus* alleviates chromium toxicity by developing synergistic relationships with zinc oxide nanoparticles in wheat. *Ecotoxicology and Environmental Safety*, 230, 113142.
 11. Ali, S., Mfarrej, MFB., Hussain, A., Akram, NA., Rizwan, M., Wang, XK., Maqbool, A., **Nafees, M.**, Ali, B. 2022. Zinc fortification and alleviation of cadmium stress by application of lysine chelated zinc on different varieties of wheat and rice in cadmium stressed soil. *Chemosphere*. 133829.
 12. Ali, S., Mfarrej, MFB., Rizwan, M., Hussain, A., Shahid, MJ., Wang, XK., **Nafees, M.**, Waseem, M., Alharby, HF. 2022. Microbe-citric acid assisted phytoremediation of chromium by castor bean (*Ricinus communis* L.). *Chemosphere*. 134065.
 13. Basit, A., Bano, Z., **Nafees, M.**, Khan, M.J., Younas, M., Zulfiqar, S., Ahmad, S., Faheem, S.M. 2024. Morphological and physiological features of genotypes of *Zea mays* towards salt tolerance influenced by mycorrhizal fungi. *Haya Saudi J Life Sci*.
 14. Maria Latif, Shafaqat Ali, Mushtaq Ahmad Ansari, Ameer Fawad Zahoor, **Muhammad Nafees**. 2024. Exploring the potential of green synthesized cerium oxide nanoparticles in mitigating chromium toxicity in maize, *Journal of King Saud University-Science*, 36(8), 103323.
 15. Sehrish, A.K., Ahmad, S., **Nafees, M.**, Mahmood, Z., Ali, S., Du, W., Naeem, M.K., Guo, H., 2024. Alleviated cadmium toxicity in wheat (*Triticum aestivum* L.) by the coactive role of zinc oxide nanoparticles and plant growth promoting rhizobacteria on *TaEIL1* gene expression, biochemical and physiological changes. *Chemosphere*. 364, 143113.

Co-author Review Papers:

1. M. K. Daud, **Muhammad Nafees**, Shafaqat Ali, Muhammad Rizwan, Raees Ahmad Bajwa, Muhammad Bilal Shakoor, Muhammad Umair Arshad, Shahzad Ali Shahid Chatha, Farah Deebe, Waheed Murad, Ijaz Malook, and Shui Jin Zhu 2017. Drinking

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Water Quality Status and Contamination in Pakistan. BioMed Research International. 18:7908183.

2. M. K. Daud, Hina Rizvi, Muhammad Farhan Akram, Shafaqat Ali, Muhammad Rizwan, **Muhammad Nafees**, and Zhu Shui Jin 2017. Review of Upflow Anaerobic Sludge Blanket Reactor Technology: Effect of Different Parameters and Developments for Domestic Wastewater Treatment. Journal of Chemistry. 13:1596319

First Author Book Chapters:

1. **Muhammad Nafees**, Shafaqat Ali, Muhammad Rizwan, Asma Aziz, Muhammad Adrees, Syed Makhdoom Hussain, Qasim Ali, Muhammad Junaid 2020. Effect of Nanoparticles on Plant Growth and Physiology and on Soil Microbes. I. Bhushan et al. (eds.), Nanomaterials and Environmental Biotechnology, Nanotechnology in the Life Sciences, Springer Nature Switzerland AG. https://doi.org/10.1007/978-3-030-34544-0_5

Co-author Book Chapters:

1. Zaid ul Hassan, Shafaqat Ali, Muhammad Rizwan, Muhammad Ibrahim, **Muhammad Nafees** and Muhammad Waseem 2017. Role of Bioremediation Agents (Bacteria, Fungi, and Algae) in Alleviating Heavy Metal Toxicity. V. Kumar et al. (eds.), Probiotics in Agroecosystem, Springer Nature Singapore Pte Ltd. https://doi.org/10.1007/978-981-10-4059-7_27

Paper, Poster Presentation, & Conferences

1. **Nafees, M.**, M. Arshad, A. Hussain, M. Naveed, S. Noureen and A. Khalid. Efficiency of biogas slurry and endophytic bacteria to improve growth and physiology of *Brassica napus* L. in chromium contaminated soil. P. 133 (ISBN 978-969-8269-02-9). In 16th International Congress of Soil Science “Healthy Soils for Food Security” organized by Soil Science Society of Pakistan. (March 15-17, 2016).
2. **Muhammad Nafees**, Adiba Khan Sehrish, Sarah Owdah Alomrani, Linlin Qiu, Aasim Saeed, Shoaib Ahmad, Shafaqat Ali, Hongyan Guo. Mechanistic approach of tannery wastewater and sulfadiazine mutual toxicity in wheat (*Triticum aestivum* L.) and mitigation through exogenous application of gallic acid. Paper presented in a “National Conference on Soil Degradation: An Alarming Threat to Food Security & Environment” on March 3-4, 2022, at Department of Soil Science, Bahauddin Zakriya University, Multan.
3. Participated in 4th International Conference on “Global Environmental Changes” May 4-5 2017, Organized by Department of Environmental Sciences & Engineering Government College University Faisalabad.
4. Participated in poster competition on “World Water Day 2019” jointly Organized by The Department of Environmental Sciences & Engineering & Pak-Eco-Friends Forum Directorate of Students’ Affairs GCUF.
5. Participated in Seminar on Groundwater arsenic contamination in Pakistan Unfolding facts and sustainable solutions” on the event of World Water Day 2019, jointly Organized by The Department of Environmental Sciences & Engineering & Pak-Eco-Friends Forum Directorate of Students’ Affairs GCUF.

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6. Participated in Seminar on World Sustainability Day 2021, Organized by Green Youth Movement Club, Directorate of Students' Affairs Government College University Faisalabad.
7. Participated and Poster Presented on "Soil Health and Sustainable Development Goals" in 19th International Congress of Soil Science" held on March 09-11, 2022 at University of Agriculture Faisalabad, Pakistan.
8. Participated in "2nd International Conference on Emerging Trends in Earth and Environmental Sciences (ETEES 2022), held at College of Earth and Environmental Sciences, University of Punjab, Quaid-e-Azam Campus, Lahore-545900 Pakistan.

Training & Workshops

1. One week training course "Water & Wastewater Sampling" on Oct 29, 2011 conducted by Klimatech Environmental Club.
2. One week training workshop "Soil, Water & Plant Analysis" from Nov 28 – Dec 02, 2011 conducted by Nuclear Institute of Agriculture & Biology (NIAB) in cooperation with Pakistan Atomic Energy Commission (PAEC).
3. Participated in "Flower Exhibition" held on March 29, 2012 organized by Department of Environmental Sciences & Engineering, GC University, Faisalabad, Pakistan.
4. One day training course "Environmental Management System" (ISO 14001-2004) held on July 3, 2012 conducted by Klimatech Environmental Club.
5. One day training workshop "Communication Skills conducted" held on June 24, 2014 organized by Career Development Center in cooperation with University of Agriculture, Faisalabad and The University of California, Davis.

Award Won

1. Laptop was awarded by Shabaz sharif Laptop scheme in 2012.
2. Laptop was awarded by Prime Minister Laptop Scheme in 2015.
3. Won Ph.D. fully funded scholarship in 2017 by Chinese Government Scholarship, Ministry of Education, China.

Google Scholar

Citations 1550+

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