Dr. Muhammad Bilal Shakoor

Assistant Professor – University of the Punjab, Pakistan

E-mail**:** bilalshakoor88@yahoo.com, bilal.cees@pu.edu.pk

Phone: +923346609020

Current Address: College of Earth & Environmental Sciences,

University of the Punjab, Lahore, Pakistan

RESEARCH INTERESTS

- Heavy metals removal from water using organic and nano-based materials.
- Wastewater treatment for nutrients recovery and recycling using green materials
- Pollutants adsorption from water using natural/modified biowastes and biochar
- Geochemistry of arsenic, source identification and health risk assessment in groundwater and soils
- Water and wastewater quality parameters assessment in groundwater and wastewater

---

EDUCATIONAL QUALIFICATIONS

- **PhD Environmental Sciences** **2013.09 - 2016.11**
  Institute of Soil and Environmental Sciences, University of Agriculture Faisalabad, Pakistan
  Thesis: Speciation and remediation of arsenic-contaminated water using agriculture and food-industry solid wastes as biosorbents
- **Masters (M. Phil) Environmental Sciences (1st position)** **2011.09 - 2013.08**
  Department of Environmental Sciences & Engineering, Government College University Faisalabad, Pakistan
  Thesis: Citric Acid Assisted Phytoremediation of Lead by *Brassica napus* L.
- **Bachelors (BS Hons.) Environmental Sciences (Gold medalist)** **2007.09 - 2011.09**
  Department of Environmental Sciences & Engineering, Government College University Faisalabad, Pakistan
  Thesis: Assessment of NPK uptake in wheat grains of different varieties

---

PROFESSIONAL EXPERIENCE

- **Assistant Professor** **09.2020 - Present**
  College of Earth and Environmental Sciences,
  University of the Punjab, Lahore Pakistan
- **Postdoctoral Researcher** **09.2019 – 08.2020**
  Institute of Urban Environment, Chinese Academy of Science, Xiamen, China
- **Assistant Professor** **20.2017 – 06.2019**
  Department of Environmental Sciences and

Engineering, Government College University
Faisalabad, Pakistan

- **Lecturer** **10.2016 – 01.2017**
  Department of Environmental Sciences,
  University of Lahore, Lahore, Pakistan
- **Teaching Assistant** **10.2015 – 01.2016**
  Institute of Soil and Environmental Sciences,
  University of Agriculture Faisalabad, Pakistan
- **Research Fellow** **12.2013 – 08.2015**
  Institute of Soil and Environmental Sciences,
  University of Agriculture Faisalabad, Pakistan

PUBLICATIONS (PEER REVIEWED)

First Author

- **Shakoor, M.B**., Khalil, U., Ali, S., Sharif, F., Ahmad, S.R., Rizwan, M., Jilani, A., Al-Ghanim, K.A. and Sarker, P.K., 2024. Microwave-assisted magnetic biochar for removal of hexavalent chromium from aqueous solution. Environmental Pollutants and Bioavailability, 36(1), 2368590. (IF = 3.3)
- **Shakoor, M. B**., Ali, S., Rizwan, M., Abbas, F., Bibi, I., Riaz, M., Khalil, U., Niazi, N. K., Rinklebe, J., 2019. A review of biochar-based sorbents for separation of heavy metals from water. International Journal of Phytoremediaiton. 22, 111-126. (IF = 4)
- **Shakoor, M.B**., Niazi, N.K., Bibi I., Shahid, M., Saqib, Z.A., Nawaz, M.F., Shaheen, S.M., Wang, H., Tsang, D. C. W., Bundschuh, J., Rinklebe, J., Ok, Y S. (2019). Exploring the potential of various biosorbents derived from biowastes for arsenic removal in water. Environment International. 123, 567-579. (IF = 13.35).
- **Shakoor, M.B**., Niazi, N.K., Bibi I., Shahid, M., Sharif, F., Bashir, S, Shaheen, S., Wang, H., Tsang, D. C. W., Ok, Y S., Rinklebe, J., (2018). Arsenic removal by natural and chemically modified water melon rind in aqueous solutions and groundwater. Science of the Total Environment. 645, 1444-1455. (IF = 10.75).
- **Shakoor, M.B**., Bibi I., Niazi, N.K., Shahid, M., Nawaz, M. F., Farooqi, A, Naidu, R., Rahman, M. M., Murtaza, G., Lüttge, A. (2018). The evaluation of arsenic contamination potential, speciation and hydrogeochemical behaviour in aquifers of Punjab, Pakistan. Chemosphere. 199, 737-746. (IF = 8.94).
- **Shakoor, M. B**., Nawaz, R., Hussain, F., Raza, M., Ali, S., Rizwan, M., and Ahmad, S. (2017). Human health implications, risk assessment and remediation of As-contaminated water: A critical review. Science of The Total Environment. 601, 756-769. (IF = 10.75).
- **Shakoor, M.B**., Niazi, N.K., Bibi I., Murtaza, G., Kunhikrishnan, A., Seshadri, B., Shahid, M., Ali, S., Bolan, N. S., .Sik, Y., Abid M., Ali, F. (2016). Remediation of Arsenic- Contaminated Water Using Agricultural Wastes as Biosorbents. Critical Reviews in Environmental Science and Technology. 46(5), 467-499. (IF = 11.75)

- **Shakoor, M.B**., Ali, S., Hameed, A., Farid, M., Hussain, S., Yasmeen, T., Najeeb, U., Bharwana, S.A., Abbasi, G.H. (2014). Citric acid improves lead (Pb) phytoextraction in Brassica napus L. by mitigating Pb-induced morphological and biochemical damages. Ecotoxicology and Environmental Safety. 109, 38-47. (IF = 7.12).

Corresponding Author

- Majeed, D., **Shakoor, M.B**., Awais, M. and Abbasi, N.A., 2026. High Adsorption Potential of Co-Pyrolyzed Biochars for Acid Blue 93 in Wastewater. Water, Air, & Soil Pollution, 237(3), 154. (IF = 3).
- Waqar, M., ul Hasan, I.M., **Shakoor, M.B**., Awais, M., Ahamd, S.R., Waseem, R.M., Ali, S., Paray, B.A., Yaseen, F., Arif, M. and Al-Sadoon, M.K., 2025. Human Health Risk Assessment and Source Identification of Toxic Heavy Metals by Multivariate Tools in Groundwater. Polish Journal of Environmental Studies, 34(5), 6391-6401. (IF = 1.3).
- Faisal, M.S., Awais, M., Bashir, R., **Shakoor, M.B**., Aziz, R., Rizwan, M., Ali, A., Akhtar, S. and Fatima, N., 2025. Impact of Tannery Effluents on Groundwater Quality and Human Health in Kasur, Pakistan. Water, Air, & Soil Pollution, 236 (15), 971. (IF = 3).
- Shakoor, M.H., **Shakoor, M.B**., Jilani, A., Ahmed, T., Rizwan, M., Dustgeer, M.R., Iqbal, J., Zahid, M., Yong, J.W.H. 2024. Enhancing Photocatalytic Degradation of Methylene Blue with Graphene Oxide Encapsulated *g*-C_3N_4/ZnO ternary Composites. ACS Omega. 9, 16187-16195. (IF = 3.7).
- Mahmood, S., Afzal, B., Bashir, R., Shakoor, M.B., Nisa, Z.U., Rizwan, M., Awais, M., Azeem, M., Wahid, A. and Yong, J.W.H., 2024. Melatonin priming could modulate primary and secondary metabolism of sunflower with better nutraceutical value and tolerance against water deficit environment. Plant Stress, 13, 100533. (IF = 6.9).
- Bashir, R., Iqbal, S., Awais, M., Afzal, B., **Shakoor, M.B.** and Iqbal, M., 2023. Thiamine (vitamin B1) helps to regulate wheat growth and yield under water limited conditions by adjusting tissue mineral content, cytosolutes and antioxidative enzymes. Plant Growth Regulation, 101(3), pp.629-642. (IF = 4.2).
- Ashraf, M.N., Ali, A., **Shakoor, M.B.,** Ahmad, S.R., Hussain, F. and Oh, S.E., 2022. Development of Novel Formaldehyde-Free Melamine Resin for Retanning of Leather and Reduced Effluent Discharge in Water. Separations, 9(11), p.368. (IF = 3.34)
- Akram, A., Muzammal, S., **Shakoor, M.B**., Ahmad, S.R., Jilani, A., Iqbal, J., Al-Sehemi, A.G., Kalam, A. and Aboushoushah, S.F.O., 2022. Synthesis and Application of Egg Shell Biochar for As (V) Removal from Aqueous Solutions. Catalysts, 12(4), p.431. (IF = 4.5).
- Khalil, U., **Shakoor, M.B**., Ali, S., Ahmad, S.R., Rizwan, M., Alsahli, A.A. and Alyemeni, M.N., 2021. Selective Removal of Hexavalent Chromium from

Wastewater by Rice Husk: Kinetic, Isotherm and Spectroscopic Investigation. Water, 13(3), p.263. (IF = 3.10)

- Hayyat, M.U., Nawaz, R., Siddiq, Z., **Shakoor, M.B**., Mushtaq, M., Ahmad, S.R., Ali, S., Hussain, A., Irshad, M.A., Alsahli, A.A. and Alyemeni, M.N., 2021. Investigation of Lithium Application and Effect of Organic Matter on Soil Health. Sustainability, 13(4), p.1705. (IF = 3.88).
- Arshad, M., Sadef, Y., **Shakoor, M.B**., Naeem, M., Bashir, F., Ahmad, S.R., Ali, S., Abid, I., Khan, N. and Alyemeni, M.N., 2021. Quantitative Estimation of the Hydroquinone, Mercury and Total Plate Count in Skin-Lightening Creams. Sustainability, 13(16), p.8786. (IF = 3.88).
- Khalil, U., **Shakoor, M. B**., Ali, S., Rizwan, M., Alyemeni, M. N., & Wijaya, L. (2020). Adsorption-reduction performance of tea waste and rice husk biochars for Cr (VI) elimination from wastewater. Journal of Saudi Chemical Society, 24(11), 799-810. (IF = 4.72)
- Ali, S., Noureen, S., **Shakoor, M.B**., Haroon, M.Y., Rizwan, M., Jilani, A., Arif, M.S. and Khalil, U., 2020. Comparative evaluation of wheat straw and press mud biochars for Cr (VI) elimination from contaminated aqueous solution. Environmental Technology & Innovation, p.101017. (IF = 7.75).
- Ali, S., Rizwan, M., **Shakoor, M.B.,** Jilani, A., Anjum, R. (2020). High sorption efficiency for As(III) and As(V) from aqueous solutions using novel almond shell biochar. Chemosphere 243, 125330. (IF = 8.94).
- Sattar, M. S., **Shakoor, M. B**., Ali, S., Rizwan, M., Niazi, N. K., & Jilani, A. (2019). Comparative efficiency of peanut shell and peanut shell biochar for removal of arsenic from water. Environmental Science and Pollution Research, 1-12.(IF = 5.19)

Co-Author

- ul Hasan, I.M., Bo, L., Zhengrong, N., Dandan, G., Yaoling, Z., **Shakoor, M.B.,** Nawaz, M.Z., Liu, Y., Qiao, J., Niazi, N.K. and Feng, H., 2025. Nano zero-valent zinc modified biochars: An innovative approach for arsenic (III) removal from synthetic and salt lake water. Journal of Molecular Liquids, 435, p.128058.
- Khan, I.U., Rahman, M.A., Othman, M.H.D., Iftikhar, M., Jilani, A., Mehmood, S., **Shakoor, M.B**., Rizwan, M. and Yong, J.W.H., 2025. Innovative solutions for palm oil mill effluent treatment: A membrane technology perspective. ACS ES&T Water, 5(7), 3538-3562. (IF = 4.3)
- Ali, A., Shaikh, I.A., Ahmad, S.R., **Shakoor, M.B**., Yong, J.W.H., Rizwan, M. and Samina, F., 2024. Application of effluent reduction methods and treatment using advanced oxidation process at leather chemicals and tanning industries. Frontiers in Environmental Science, 12, 1422107. (IF = 3.3)
- Hannan, F., Iqbal, M., Islam, F., Farooq, M.A., **Shakoor, M.B**., Ayyaz, A., Khan, M.S.S., Li, J., Huang, Q. and Zhou, W., 2024. Remediation of Cd-polluted soil, improving Brassica napus L. growth and soil health with Hardystonite synthesized with zeolite, limestone, and green Zinc oxide nanoparticles. Journal of Cleaner Production, 437, 140737. (IF = 9.7)

- Dustgeer, M.R., Jilani, A., Ansari, M.O., **Shakoor, M.B**., Ali, S., Imtiaz, A., Zakria, H.S. and Othman, M.H.D., 2024. Reduced graphene oxide supported polyaniline/copper (II) oxide nanostructures for enhanced photocatalytic degradation of Congo red and hydrogen production from water. Journal of Water Process Engineering, 59, 105053. (IF = 6.3)
- Shakil, S., Abbasi, N.A., **Shakoor, M.B**., Ahmad, S.R., Majid, M., Ali, A. and Farwa, U., 2023. Assessment of physicochemical parameters and trace elements in tannery wastewater treatment facility and associated health risks. International Journal of Environmental Science and Technology, pp.1-14. (IF = 3.51)
- Jilani, A., Ansari, M.O., ur Rehman, G., **Shakoor, M.B**., Hussain, S.Z., Othman, M.H.D., Ahmad, S.R., Dustgeer, M.R. and Alshahrie, A., 2022. Phenol removal and hydrogen production from water: Silver nanoparticles decorated on polyaniline wrapped zinc oxide nanorods. Journal of Industrial and Engineering Chemistry, 109, 347-358 (IF = 6.76).
- Farid, M., Abubakar, M., Asam, Z.U.Z., Sarfraz, W., Abbas, M., **Shakoor, M.B**., Ali, S., Ahmad, S.R., Jilani, A., Iqbal, J. and Al-Sehemi, A.G., 2022. Microwave Irradiation and Glutamic Acid-Assisted Phytotreatment of Textile and Surgical Industrial Wastewater by Sorghum. Molecules, 27(13), .4004. (IF = 4.92).
- Irshad, M.A., **Shakoor, M.B**., Nawaz, R., Yasmeen, T., Arif, M.S., Rizwan, M., ur Rehman, M.Z., Ahmad, S.R., Latif, M., Nasim, I. and Ali, S., 2022. Green and eco-friendly synthesis of TiO2 nanoparticles and their application for removal of cadmium from wastewater: reaction kinetics study. Zeitschrift für Physikalische Chemie, 236(5), pp.637-657 (IF = 4.35).
- Irshad, M. A., Ur Rehman, M. Z., Anwar-ul-Haq, M., Rizwan, M., Nawaz, R., **Shakoor, M. B.,** Wijaya, L., Alyemeni, M. N., Ahmad, P. & Ali, S. 2021. Effect of green and chemically synthesized titanium dioxide nanoparticles on cadmium accumulation in wheat grains and potential dietary health risk: A field investigation. Journal of Hazardous Materials, 125585. (IF = 14.22).
- Hussain, M.M., Bibi, I., Niazi, N.K., Shahid, M., Iqbal, J., **Shakoor, M.B**., Ahmad, A., Shah, N.S., Bhattacharya, P., Mao, K. and Bundschuh, J., 2021. Arsenic biogeochemical cycling in paddy soil-rice system: Interaction with various factors, amendments and mineral nutrients. Science of The Total Environment, p.145040. (IF = 10.75).
- Ishaq, H.K., Farid, M., Zubair, M., Alharby, H.F., Asam, Z.U.Z., Farid, S., Bamagoos, A.A., Alharbi, B.M., **Shakoor, M.B**., Ahmad, S.R. and Rizwan, M., 2021. Efficacy of Lemna minor and Typha latifolia for the treatment of textile industry wastewater in a constructed wetland under citric acid amendment: A lab scale study. Chemosphere, p.131107. (IF = 8.94).
- Ashar, A., Bhatti, I.A., Jilani, A., Mohsin, M., Rasul, S., Iqbal, J., **Shakoor, M.B**., Al-Sehemi, A.G., Wageh, S. and Al-Ghamdi, A.A., 2021. Enhanced Solar Photocatalytic Reduction of Cr (VI) Using a (ZnO/CuO) Nanocomposite Grafted

onto a Polyester Membrane for Wastewater Treatment. Polymers, 13(22), p.4047. (IF = 4.96).

- Dustgeer, M.R., Asma, S.T., Jilani, A., Raza, K., Hussain, S.Z., **Shakoor, M.B**., Iqbal, J., Abdel-wahab, M.S. and Darwesh, R., 2021. Synthesis and characterization of a novel single- phase sputtered Cu2O thin films: Structural, antibacterial activity and photocatalytic degradation of methylene blue. Inorganic Chemistry Communications, 128, p.108606. (IF = 3.42)
- Amen, R., Bashir, H., Bibi, I., Shaheen, S. M., Niazi, N. K., Shahid, M., Hussain, M. M, Antoniadis, V., **Shakoor, M.B**., Al-Solaimani, S.G. and Wang, H. (2020). A critical review on arsenic removal from water using biochar-based sorbents: The significance of modification and redox reactions. Chemical Engineering Journal, 125195.(IF = 16.74)
- Nawaz, N., Ali, S., Shabir, G., Rizwan, M., **Shakoor, M.B**., Shahid, M.J., Afzal, M., Arslan, M., Hashem, A., Abd_Allah, E.F. and Alyemeni, M.N., 2020. Bacterial Augmented Floating Treatment Wetlands for Efficient Treatment of Synthetic Textile Dye Wastewater. Sustainability, 12(9), p.3731. (IF = 3.88)
- Irshad, M.A., **Shakoor, M.B**., Ali, S., Nawaz, R., Rizwan, M. (2019). Synthesis and Application of Titanium Dioxide Nanoparticles for Removal of Cadmium from Wastewater: Kinetic and Equilibrium Study. Water, Air, and Soil Pollution 230, 278. (IF = 2.98)
- Jilani, A., Hussain, S.Z., Othman, M.H., Zulfiqar, U., **Shakoor, M.B**., Khan, I.U., Iqbal, J., Al-Ghamdi, A.A., Alshahrie, A. (2018). A comprehensive study on the surface chemistry of particulate matter collected from Jeddah, Saudi Arabia. Journal of Atmospheric Chemistry. 3, 271–283. (IF = 3.36).
- Raza, M., Hussain, F., Lee, J. Y., **Shakoor, M.B**., & Kwon, K. D. (2017). Groundwater status in Pakistan: A review of contamination, health risks, and potential needs. Critical Reviews in Environmental Science and Technology. 47, 1713-1762 (IF = 11.75).
- Daud, M.K., Nafees, M., Ali, S., Rizwan, M., Bajwa, R.A., **Shakoor, M.B**., Arshad, M.U., Ali, S., Chatha, S., Deeba, F. and Murad, W., (2017). Drinking Water Quality Status and Contamination in Pakistan. BioMed Research International. 2017, 1-18. (IF = 5.1).
- Waqas, H., Shan, A., Khan, Y. G., Nawaz, R., Rizwan, M., Rehman, S. U., **Shakoor, M. B**., Ahmed, W., Jabeen, M. (2017). Human health risk assessment of arsenic in groundwater aquifers of Lahore, Pakistan. Human and Ecological Risk Assessment: An International Journal. 1-15. (IF = 4.99).
- Rizwan, M., Ali, S., Hussain, A., Ali, Q., **Shakoor, M. B**., Zia-ur-Rehman, M., Farid, M and Asma, M. (2017). Effect of zinc-lysine on growth, yield and cadmium uptake in wheat (Triticum aestivum L.) and health risk assessment. Chemosphere, 187, 35-42. (IF = 8.94).
- Rizwan, M., Ali, S., Akbar, M. Z., **Shakoor, M. B**., Mahmood, A., Ishaque, W., and Hussain, A. (2017). Foliar application of aspartic acid lowers cadmium uptake and

Cd- induced oxidative stress in rice under Cd stress. Environmental Science and Pollution Research, 24(27), 21938-21947. (IF= 5.1).

- Niazi, N.K., Bibi, I., Fatimah, A., Shahid, M., Javed, M.Y., Wang, H., Bashir, S., Ok, Y.S., Murtaza, B., Saqib, Z.A., **Shakoor, M.B.** (2017). Phosphate-assisted phytoremediation of arsenic by Brassica napus and Brassica juncea: Morphological and physiological response. International Journal of Phytoremediation. 19(7), 670-678. (IF = 4).
- Khaliq, A., Ali, S., Hameed, A., Farooq, M.A., Farid, M., **Shakoor, M.B**., Mahmood, K., Ishaque, W., Rizwan, M., (2016). Silicon alleviates nickel toxicity in cotton seedlings through enhancing growth, photosynthesis and suppressing Ni uptake and oxidative stress. Archives of Agronomy and Soil Science. 62(5), 633-647. (IF= 2.24).
- Farid, M., Ali, S., Ishaque, W., **Shakoor, M.B**., Niazi, N.K., Bibi, I., Dawood, M., Gill, R.A., Abbas, F. (2015). Exogenous application of EDTA enhanced phytoremediation of cadmium by Brassica napus L. International Journal of Environmental Science and Technology. 12, 3981-3992. (IF = 3).
- Zaheer, I.E., Ali, S., Rizwan, M., Farid, M., **Shakoor, M.B**., Gill, R.A., Najeeb, U., Iqbal, N., Ahmad, R. (2015). Citric acid assisted phytoremediation of copper by Brassica napus L. Ecotoxicology and Environmental Safety. 120, 310-317. (IF = 7.12).
- Kanwal, U., Ali, S., **Shakoor, M.B**., Farid, M., Hussain S, Yasmeen T, Adrees M, Bharwana SA, Abbas F. (2014). EDTA ameliorates phytoextraction of lead and plant growth by reducing morphological and biochemical injuries in Brassica napus L. under lead stress. Environmental Science and Pollution Research. 21, 9899-9910. (IF= 5.1).
- Habiba, U., Ali, S., Farid, M., **Shakoor, M.B**., Rizwan, M., Ibrahim, M., Abbasi, G.H., Hayat, T., Ali, B. (2014). EDTA enhanced plant growth, antioxidant defense system and phytoextraction of copper by Brassica napus L. Environmental Science and Pollution Research. 22, 1534-44. (IF= 5.1).
- Ehsan, S., Ali, S., Noureen, S., Mehmood, K., Farid, M., Ishaque, W., **Shakoor, M.B**., Rizwan, M. (2014). Citric acid assisted phytoremediation of Cd by Brassica napus L. Ecotoxicology and Environmental Safety. 106, 164-172. (IF= 7.12).

ACHIEVEMENTS AND AWARDS

- Awarded **Gold Medal** in Bachelor (BS Hons.) degree.
- **1st position** in Masters (M. Phil) degree
- Won the **Early Career Research Award** for oral presentation in the 14th International Conference on the Biogeochemistry of Trace Elements (ICOBTE), July, 16-20, 2017, Zurich, Switzerland.

- Won the **Student travel award** to present poster in the 13th International Conference on the Biogeochemistry of Trace Elements (ICOBTE), July, 12-16, 2015, Fukuoka, Japan.
- **3rd position** in PhD research proposal **oral** competition 2015, organized by Office of Research, Innovation and Commercialization, University of Agriculture, Faisalabad, Pakistan.

RESEARCH PROJECTS

- Award of Punjab University Research Project titled **"Application of biochar for removing toxic arsenic from contaminated water".** PKR 0.2 million.
- Award of Punjab University Research Project titled **"Efficient Remediation of Chromium from Wastewater using Engineered Biochar".** PKR 0.2 million.
- Award of HEC Start-up Research Grant titled **"Arsenic removal from contaminated water using biochar derived from biowastes".** PKR 0.48 million.

BOOK CHAPTERS

- Shahbaz, F., **Shakoor, M.B**., Abbasi, N.A., Ahmad, S.R., Majid, M. and Sharif, F., 2025. Remediation of Heavy Metals Loaded Wastewater Using Organic Solid Waste-Based Sorbents. In Smart Waste and Wastewater Management by Biotechnological Approaches (pp. 393-410). Singapore: Springer Nature Singapore.
- Muzammal, S., Akram, A., **Shakoor, M.B**., Ahmad, S.R., Farid, M. and Shakoor, M.H., 2023. Biochar-Assisted Phytoremediation for Heavy Metals-Contaminated Soils. In *New Frontiers in Plant-Environment Interactions: Innovative Technologies and Developments* (pp. 359-384). Cham: Springer Nature Switzerland.
- Farid, M., Sarfraz, W., Shahbaz, S., **Shakoor, M.B**., Afzal, H., Kanwal, S., Tahir, A., Tahir, M. and Butt, M.S., 2023. Role of Microbial Ecology to Manage Remediation and Degradation Processes in the Environment. In *Climate-Resilient Agriculture, Vol 1: Crop Responses and Agroecological Perspectives* (pp. 731-750). Cham: Springer International Publishing.
- Younas, F., Bibi, I., Zulfqar, A., Shahid, M., **Shakoor, M.B**., Hussain, M.M., Niazi, N.K. and Nawaz, M.F., 2023. Environmental Applications of Natural and Surface-Modified Zeolite. *In Clay Composites: Environmental Applications* (pp. 373-396). Singapore: Springer Nature Singapore.
- Dustgeer, M.R., Zakria, H.S., Jilani, A., Ahmad, S.R., **Shakoor, M.B**., Othman, M.H.D. and Ansari, S.P., 2023. Use of Carbon based photocatalyst for metal removal. In *Emerging Techniques for Treatment of Toxic Metals from Wastewater* (pp. 475-494). Elsevier.
- Ashraf, S., Ahmad, S.R., Ali, Q., **Shakoor, M.B**., Ashraf, S., Nawaz, H., Chaudhry, H. and Majid, Z., 2023. Bioformulations for Sustainable Phytoremediation of Heavy Metal-Polluted Soil. In *Phytoremediation: Management of Environmental Contaminants, Volume 7* (pp. 101-125). Cham: Springer International Publishing.

- Farid, M., Qadri, A., Hayat, U., **Shakoor, M.B**., Abbas, M., Masood, A., Mehak, K., Khizar, A. and Raza, N., 2022. Sustainable Urban Forestry, Merits, Demerits, and Mitigation of Climate Change at Global Scale. In *Managing Plant Production Under Changing Environment* (pp. 375-401). Singapore: Springer Nature Singapore.
- Muzammal, S., Akram, A., **Shakoor, M.B**., Jilani, A., Ahmad, S.R., Farid, M. and Niazi, N.K., 2022. Modified Biosorbents as Potential Biomaterials for Arsenic Removal from Contaminated Water. In *Global Arsenic Hazard: Ecotoxicology and Remediation* (pp. 335-354). Cham: Springer International Publishing.
- **Shakoor, M.B**., ul Hasan, I.M., Ahmad, S.R., Farid, M., Majid, M., Bibi, I., Jilani, A., Kokab, T. and Niazi, N.K., 2022. Developments in Membrane Technologies and Ion-Exchange Methods for Arsenic Removal from Aquatic Ecosystems. *Arsenic in Plants: Uptake, Consequences and Remediation Techniques*, pp.315-329.
- **Shakoor, M.B**., Iftikhar, U., Ahmad, S.R., Ashraf, S., Farid, M. and Kokab, T., 2022. Strategies to Reduce Heavy Metal Contamination in Soil-Plant System. In Heavy Metal Toxicity in Plants: Physiological and Molecular Adaptations (pp. 171-180). 6000 Broken Sound Parkway NW, Suite 300, Boca Raton, FL 33487-2742: CRC Press.
- Farid, M., Khair, K.U., Bakht, S., Azhar, W., **Shakoor, M.B**., Zubair, M., Rizwan, M., Farid, S., Ishaq, H.K. and Ali, S., 2021. Production of Bioplastics by Different Methods—A Step Toward Green Economy: A Review. Nanotechnology, Springer. pp.109-139.
- Amen, R., Irshad Bibi, M.S., Niazi, N.K., Zulfqar, A., Nawaz, M.F., **Shakoor, M.B**., Mukhtar, A. and Rehman, T., 2021. Developments in Nanoadsorbents for the Treatment of Arsenic-Contaminated Water. Arsenic Toxicity: Challenges and Solutions, p.325.
- Hussain, M. M., Bibi, I., Shahid, M., Shaheen, S. M., **Shakoor, M. B.,** Bashir, S., Younas F., Rinklebe J., Niazi, N. K. 2019. Biogeochemical cycling, speciation and transformation pathways of arsenic in aquatic environments with the emphasis on algae. Comprehensive Analytical Chemistry. Elsevier B.V. pp 15-51.
- **Shakoor, M.B**., Riaz, M., Niazi, N.K., Ali, S., Rizwan, M., Arif, M.S., Arif, M. 2019. Recent Advances in Arsenic Accumulation in Rice. In *Advances in Rice Research for Abiotic Stress Tolerance* Woodhead Publishing. Elsevier. pp. 385-398.
- Riaz, M., Arif, M.S., Ashraf, M.A., Mahmood, R., Yasmeen, T., **Shakoor, M.B**., Shahzad, S.M., Ali, M., Saleem, I., Arif, M. and Fahad, S. 2019. A Comprehensive Review on Rice Responses and Tolerance to Salt Stress. In *Advances in Rice Research for Abiotic Stress Tolerance*. Woodhead Publishing. Elsevier. pp. 133-158.
- Arif, M., Jan, T., Riaz, M., Fahad, S., Arif, M. S., **Shakoor, M. B**., abd Rasul, F. 2019. Advances in Rice Research for Abiotic Stress Tolerance: Agronomic Approaches to Improve Rice Production Under Abiotic Stress. In *Advances in Rice Research for Abiotic Stress Tolerance*. Woodhead Publishing. Elsevier. pp. 585-614.

- Niazi, N.K., Murtaza, B., Bibi, I., Shahid, M., White, J.C., Nawaz, M.F., Bashir, S., **Shakoor, M.B.**, Choppala, G., Murtaza, G., Wang, H. 2016. Removal and Recovery of Metals by Biosorbents and Biochars Derived From Biowastes. In *Environmental Materials and Waste*. Academic Press, Elsevier, USA, pp. 149-177.
- Nabeel, N.K., Bashir, S., Bibi, I., Murtaza, B., Shahid, M., Javed, M.T., **Shakoor, M.B**., Saqib, Z.A., Nawaz, M.F., Aslam, Z., Wang, H., Murtaza, G. 2016. Phytoremediation of Arsenic-Contaminated Soils Using Arsenic Hyperaccumulating Ferns." In *Phytoremediation*, Springer International Publishing, Switzerland. pp. 521-545.
- Murtaza, G., **Shakoor, M.B**., and Niazi N.K. 2016. Accumulation of Heavy Metals in Cereal and Legume Crops through Sewage Water Irrigation and Phosphate Fertilisers (Pakistan). In: Hiroshan Hettiarachchi and Reza Ardakanian (eds). Safe Use of Wastewater in Agriculture: Good Practice © 2016 UNU-FLORES pp. 171-196.

CONFERENCES AND TRAININGS/WORKSHOPS

- Participated as invited speaker in **International Conference on Sustainable Future Food Systems and Lyallpur Industrial Expo**, April 29-30, 2024
- Participated and organized "**4th International Conference on Emerging Trends in Earth and Environmental Sciences (ETEES)**" December 4-6, 2023 at College of Earth & Environmental Sciences, University of the Punjab, Lahore
- Participated in **U.S. EPA Small Drinking Water Systems Webinar Series Lead and Copper**, March 28, 2023, US-EPA. USA
- Participated in **1st International Conference on Climate Change and Environment**, February 2-3, 2022, Quaid-e-Azam University, Islamabad.
- Participated and organized "**3rd International Conference on Emerging Trends in Earth and Environmental Sciences (ETEES)**" November 16-19, 2021 at College of Earth & Environmental Sciences, University of the Punjab, Lahore
- Participated in 1st Webinar "**Global Trends in Combating Environmental and Agricultural Issues" Department of Environmental Sciences**" June 5, 2021, University of Okara, Okara, Pakistan.
- Participated in "**1st International Symposium on Current Trends and Future Perspectives in Botanical Research"** November 10, 2020, Department of Botany University of Okara, Okara, Pakistan
- Participated in "**8th International Conference: Environmentally Sustainable Development – ESDev-VIII"** 21-23 August 2019 at COMSATS University Islamabad, Abbottabad Campus, Pakistan.
- Participated in "**Ist International Conference on Surface Science innovations and applications for geo-environmental challenges"** April, 25-26, 2019, at Institute of Soil and Environmental Sciences, University of Agriculture Faisalabad, Pakistan

- Participated in the "**Panel discussion/symposium on battling climate change and water crises**" October 29 2018, held at Institute of Soil and Environmental Sciences, University of Agriculture Faisalabad, Pakistan.
- Participated in the 4th "**International Conference on Global Environmental Changes"** May 4-5, 2017, held at Department of Environmental Sciences and Engineering Government College University Faisalabad, Pakistan.
- Participated in the **"International Conference on Materials Science and Nanotechnology**" 25th September, 2016, The University of Lahore, Pakistan.
- Participated in the 16th **"International Congress of Soil Science on Healthy Soils for Food Security**" 15-17 March, 2016, Rawalpindi, Pakistan.
- Participated in "**International Conference of Biochemistry, Biotechnology and Biomaterials (ICBBB-2016)**" February, 22-24, 2016, at Department of Biochemistry, University of Agriculture Faisalabad, Pakistan
- Participated in "**International Conference on Soil Sustainability for Food Security"** November, 15-17, 2015, at Institute of Soil and Environmental Sciences, University of Agriculture Faisalabad, Pakistan
- Participated in the 13th "**International Conference on the Biogeochemistry of Trace Elements (ICOBTE)"**, July 12-16, 2015, Fukuoka, Japan
- Training course for "**Hydride Generation Atomic Absorption Spectrometer (HG-AAS)"** on 13 June, 2014 conducted at University of Agriculture, Faisalabad, Pakistan.
- Participated in one day seminar entitled "**New Horizons and Recent Advances in Chemical and Biological Sciences**" February 14, 2013 held at Department of Chemistry GC University Faisalabad.
- Participated in "**1st International Conference on Global Climate Changes**" January 15-16 2013 held at Department of Environmental Science G C University Faisalabad.
- Participated in "**Training Course on Sustainable Wetland Management**" From February 27th to 1th of March 2012 held at Department of Wildlife and Fisheries Government College University Faisalabad.
- Participated in "**Climate Change Consequences and Mitigation**" June 16, 2012 held at FCCI complex, East canal road Faisalabad.
- 3 months Internship training on advanced techniques used in "**Water management"** at Nuclear Institute for Agriculture and Biology (NIAB), Faisalabad from 15-03-2011 to 14-06-2011.
- Participation in skit on **World Environment Day 2011** at Department of Environmental Sciences Government College University Faisalabad.

ORAL/POSTER PRESENTATIONS

- **Oral and poster presentations** in "**4th International Conference on Emerging Trends in Earth and Environmental Sciences (ETEES)**" December 4-6, 2023 at College of Earth & Environmental Sciences, University of the Punjab, Lahore

- **Oral and poster presentations** in "**3rd International Conference on Emerging Trends in Earth and Environmental Sciences (ETEES)**" November 16-19, 2021 at College of Earth & Environmental Sciences, University of the Punjab, Lahore
- **Oral Presentation** in "**8th International Conference: Environmentally Sustainable Development – ESDev-VIII"** 21-23 August 2019 at COMSATS University Islamabad, Abbottabad Campus, Pakistan.
- **Oral presentation** in **Ist International Conference on Surface Science innovations and applications for geo-environmental challenges, 2019** at Institute of Soil and Environmental Sciences, University of Agriculture Faisalabad, Pakistan.
- **Poster presentation** in **Ist International Conference on Surface Science innovations and applications for geo-environmental challenges, 2019** at Institute of Soil and Environmental Sciences, University of Agriculture Faisalabad, Pakistan
- **Oral presentation** in International Congress of Soil Science on "Healthy Soils for Food Security 15-17 March, 2016, Rawalpindi, Pakistan.
- **Poster presentation** in International Congress of Soil Science on "Healthy Soils for Food Security 15-17 March, 2016, Rawalpindi, Pakistan.
- **Oral presentation** in International Conference on Soil Sustainability for Food Security 2015, at Institute of Soil and Environmental Sciences, University of Agriculture Faisalabad, Pakistan
- **Oral presentation** in International Conference of Biochemistry, Biotechnology and Biomaterials (ICBBB-2016) at Department of biochemistry, University of Agriculture Faisalabad, Pakistan
- **Poster presentation** in the International Conference on the Biogeochemistry of Trace Elements (ICOBTE), 2015, Fukuoka, Japan.

ABSTRACTS PUBLISHED IN CONFERENCES

- Kokab, T., Ashraf, H. S., **Shakoor, M. B**., Ahmad, S.R., Jilani, S. Adsorption of aqueous Cr(VI) onto walnut shell biochar: isotherm, kinetic and spectroscopic study. Proceedings of 3rd International Conference on Emerging Trends in Earth and Environmental Sciences (ETEES)" November 16-19, 2021 at College of Earth & Environmental Sciences, University of the Punjab, Lahore
- Akram S., Muzammal, S., **Shakoor, M. B**., Ahmad, S.R., Jilani, S. Arsenic removal from contaminated water using egg shell biochar. Proceedings of 3rd International Conference on Emerging Trends in Earth and Environmental Sciences (ETEES)" November 16-19, 2021 at College of Earth & Environmental Sciences, University of the Punjab, Lahore
- Ali S, **Shakoor, M. B**., Rizwan, M., Jilani, A., Niazi, N. K., Anjum, R. Sorption of arsenite and arsenate by almond shell derived biochar from aqueous environments. Proceedings of 8th International Conference: Environmentally Sustainable

Development – ESDev-VIII" 21-23 August 2019 at COMSATS University Islamabad, Abbottabad Campus, Pakistan.

- **Shakoor, M.B**., Niazi, N.K., Bibi I. (2019). Sorption potential of various biosorbents for arsenic removal in aqueous solutions. Proceedings of 1st International Conference on Surface Science innovations and applications for geo-environmental challenges, 2019 at Institute of Soil and Environmental Sciences, University of Agriculture Faisalabad, Pakistan.
- Sattar, M. S., **Shakoor, M. B**., Ali, S., Rizwan, M., Niazi, N. K., Riaz, M., Arif, M. S. (2019). Comparative efficiency of peanut shell and peanut shell biochar for removal of arsenic from water. Proceedings of 1st International Conference on Surface Science innovations and applications for geo-environmental challenges, 2019 at Institute of Soil and Environmental Sciences, University of Agriculture Faisalabad, Pakistan.
- Riaz, M., Ahmad A., Arif, M. S., Ali M., Yasmeen, T., **Shakoor, M. B**., Rizwan, M., Arif, M., Ali, S. (2019). Chemical and biological degradation of biochars depend on biochars' chemistry and temperature under laboratory conditions. Proceedings of 1st International Conference on Surface Science innovations and applications for geo-environmental challenges, 2019 at Institute of Soil and Environmental Sciences, University of Agriculture Faisalabad, Pakistan.
- Niazi, N. K, **Shakoor, M.B**., Bibi, I., Shahid, M., Lüttge, A., Naidu, R., Rahman, M. M., and Nawaz, M. F. (2017) Goldschmidt, Paris, France, 13th to 18th August, 2017.
- **Shakoor, M. B**., Niazi, N. K, Bibi, I., Nawaz, M. F., Bashir, S., Saqib, Z. A., Ok, Y. S. (2016). Exploring arsenic sorption to natural biosorbents in aqueous solutions. Proceedings of "The International Conference on Forestry and Environment: Challenges and Prospects" 21st and 22nd November, 2016, Pakistan.
- **Shakoor, M. B**., Niazi, N. K., Bibi, I., Nawaz, M.F., Zahir, Z. A., Bashir, S., Saqib, Z. A., Ok. Y. S., Abid, M., Wang, H. (2016). Evaluation of various natural biosorbents for immobilization of arsenic(III) and arsenic(V) in aqueous environments. Proceedings of 16th International Congress of Soil Science on "Healthy Soils for Food Security" 15th to 17th March, 2016, Pakistan.
- **Shakoor, M. B**., Niazi, N. K., Bibi, I., Rahman, M. M. Naidu, R., Murtaza, G. Bashir, S., Abid. M. Wang, H. (2016). Understanding arsenic release mechanisms in aquifers of Punjab, Pakistan. Proceedings of 16th International Congress of Soil Science on "Healthy Soils for Food Security" 15th to 17th March, 2016, Pakistan.
- Abid, M., Niazi, N. K., Bibi, I., Murtaza, G., **Shakoor, M. B**., Mahmood, M., Husnain, S. N., Ok, Y. S. (2016). Orange peel: A potential biowaste to remove As(V) from aqueous environments. Proceedings of 16th International Congress of Soil Science on "Healthy Soils for Food Security" 15th to 17th March, 2016, Pakistan.
- Hasan, I. M., Bibi, I., Niazi, N. K., Asghar, H. N., **Shakoor, M. B**., Hussain, M. A., Bashir, S., Aslam, Z., Saqib, Z. A., Khan, M. Y. (2016). Bioavailability of arsenic under the influence of bacterial induced arsenate–sulfate reduction to maize (*Zea*

mays L.). Proceedings of 16th International Congress of Soil Science on “Healthy Soils for Food Security” 15th to 17th March, 2016, Pakistan.

- **Shakoor, M. B**., Niazi, N. K., Bibi, I., Nawaz, M.F., Murtaza, G., Ok, Y. S. Abid, M. (2016). Arsenic Removal From Contaminated Water By Using Novel Biowastes. Proceedings of International Conference of Biochemistry, Biotechnology and Biomaterials (ICBBB-2016), Pakistan, 22nd to 24th February, 2016.
- Abid, M., Niazi, N.K., Bibi I., Murtaza G, **Shakoor, M. B**., Mahmood, M., Husnain, S. N., Ok, Y.S. (2016). Application of Natural and Charred Orange Peel for the Immobilization of Arsenic (v) from Aqueous Solutions. Proceedings of International Conference of Biochemistry, Biotechnology and Biomaterials (ICBBB-2016). Pakistan, 22nd to 24th February, 2016.
- **Shakoor M.B**., Niazi N.K., Bibi I., Murtaza G., Nawaz M.F., Rahman MM., Naidu R., Shahid, M., Ali S., Ok Y.S., Arshad M. and Abid M. (2015). Speciation, Health Risk Assessment and Geochemical Behaviour of Arsenic in Groundwater of Punjab, Pakistan. Proceedings of International Conference on Soil Sustainability for Food Security. Pakistan, 15th to 17th November, 2015.
- Sharif F., Niazi N.K., Bibi I., **Shakoor M.B**., Shahid M., Ok, Y.S., Bashir S. and Nawaz M.F. (2011). Arsenite Biosorption to Xanthated Corn Cob in Aqueous Environments. Proceedings of International Conference on Soil Sustainability for Food Security. Pakistan, 15th to 17th November, 2015. (Poster).
- Mahmood M., Bibi I., Niazi N.K., Shahid, M., **Shakoor, M.B**., Ok Y.S., Murtaza G. and Abid M. (2015). Arsenic(III) Immobilization by Natural and Chemically Modified Sugarcane Bagasse in Aqueous Solutions. Proceedings of International Conference on Soil Sustainability for Food Security. Pakistan, 15th to 17th November, 2015.
- Abid M., Niazi N.K., Bibi I., Ok S.K., Shahid M., **Shakoor M.B**., Lgalavithana A.D. (2015). Immobilization of Arsenic(V) By Charred Orange Peel in Aqueous Solutions. Proceedings of International Conference on Soil Sustainability for Food Security. Pakistan, 15th to 17th November, 2015.
- Aqeel M., Bibi I., Niazi N.K., **Shakoor M.B**., Abid M. and Ok Y.S. (2015). Removal of Arsenic from Water by Using Natural and Akaganéite-Coated Water Chestnut Shell as a Biosorbent. Proceedings of International Conference on Soil Sustainability for Food Security. Pakistan, 15th to 17th November, 2015.
- **Shakoor M.B**., Niazi N.K., Bibi I., Rahman M.M. Naidu R., Murtaza G., Shahid M., Arshad M. and Abid. M. (2015). Geochemical characterisation and health risk assessment of arsenic in groundwater from rural areas of Punjab, Pakistan. Proceedings of 13th International Conference on the Biogeochemistry of Trace Elements (ICOBTE). Japan, 12th to 16th July, 2015.
- **Shakoor, M. B**., Ali, S. (2013). Citric Acid Assisted Phytoremediation of Lead by *Brassica napus* L. Abstract paper of 21st International Symposium on Environmental Biogeochemistry, Wuhan, China. 67.
- Khalaq, A., Ali, S., Habib, A., **Shakoor, M.B**., Farid, M., Bharwana, S.A., Hussain, S., Yasmeen, T., Adrees, M. (2013). Morpho-Physiological and Biochemical

Response of Brassica napus L. under Nickel Stress Alleviated by Silicon Application. Proceedings of 1st international conference on applied chemistry (ICAC), GCUF, Pakistan.

- Ehsan, S., Ali, S., Farid, M., **Shakoor, M.B.,** Ishaque, W., Yasmeen, T., Hussain, S., Bharwana, S.A., Ibrahim, M. (2013). Citric Acid assisted phytoremediation of cadmium by *Brassica napus* L. Proceedings of 1st international conference on applied chemistry (ICAC), GCUF, Pakistan.
- Zaheer, I. E., Ali, S., Farid, M., **Shakoor, M.B**.,Virk, Z.A., Rizwan, M., Adrees, M., Ibrahim, M., Bharwana, S.A.(2013). Phytoxtraction of copper and plant growth ameliorated by citric acid by alleviating morphological and biochemical injuries in Brassica napus L under copper toxicity. Proceedings of 1st international conference on applied chemistry (ICAC), GCUF, Pakistan.
- Huma, N., Ali, S., Farid, M., **Shakoor, M. B**., Yasmeen, T., Hannan, F., Ahmad, R. (2013). Isolations of probiotic and its utilization in yogurt preparation. Proceedings of 3rd international conference on Functional Food and Nutraceuticals, Nutricon.

STUDENTS GUIDED

NAME	DEGREE	SESSION	TITLE OF THESIS	RESPONSIBILITY
Asma Akram	M Phil	2021-23	Comparative analysis of ZnO/KOH activated peanut shell biochar for phosphate adsorption from aqueous solution	Supervisor
Tahira Jamil	M Phil	2021-23	Application of polyaniline based nanocomposites for enhanced removal of lead from aqueous solution	Supervisor
Seemal Basit	M Phil	2021-23	Comparative analysis of green and chemical synthesis of aluminum oxide nano-particles for phenol removal in wastewater	Supervisor

Fatima Farooq	M Phil	2021-23	Efficient removal of methylene blue dye from wastewater using manganese oxide and polypyrrole nanocomposites	Supervisor
Shazma Muzammal	M Phil	2021-23	Enhanced adsorption performance of Zn-Fe LDH biochar composites for removal of As(V) from contaminated water	Supervisor
Nida Rasool	M Phil	2021-23	Cetyltrimethylammonium bromide (CTBA) supported graphitic carbon nitride and polyaniline nanocomposites for enhanced removal of Cr(VI) from wastewater	Supervisor
Muhammad Abdullah	M Phil	2021-23	Arsenic contamination and health risk assessment in groundwater of urban areas in Lahore, Pakistan	Supervisor
Faiza Zahid Hira Sawaira Hadiqa Usman Tayyba Fatima	BS	2019-23	Assessing the heavy metals contamination in groundwater residential areas of lahore, pakistan	Supervisor
Fatima Ijaz Fasiha Shahbaz Amina Amanat	BS	2019-23	Effective removal of methyl orange from wastewater by grapefruit peel-based biosorbent	Supervisor
Akasha Amjad Muhammad Tayyab Rana Uzair Ishtiaq	BS	2019-23	Assessing the concentration of heavy metals in tree leaves in Lahore, Pakistan	Supervisor

Laiba Razzaq Mariyam	BS	2019-23	Adsorption of Pb ions from aqueous solution by water hyacinth biochar	Supervisor
Alishba Sadaf Malaika Aslam	BS	2018-22	Potential of mosambi (*Citrus limetta*) peel biochar for Cr(VI) elimination from contaminated water	Supervisor
Fatima Ashfaq Faseeha Syed	BS	2018-22	Decontamination of phosphate-rich wastewater by applying enginereed date seed biochar	Supervisor
Marriam Riaz Ayesha Naveed Mahnoor Irfan	BS	2018-22	Treatment of aqueous As(V) by modified onion skin as biosorbent	Supervisor
Sobia Iftikhar Mariam Wazir Shumaila Malik	MSc	2020-22	Peanut shell biochar for Pb removal from aqueous solution	Supervisor
Sunya Ramzan Afshan Kiran	MSc	2019-21	Assessment of ground water contamination and health risk assessment, in Lahore, Pakistan	Supervisor
Asma Akram Shazma Muzammal	BS	2017-21	Treatment of Arsenic-Contaminated Water using Egg Shell Biochar	Supervisor
Tanzeela Kokab Hafiza Sumbal Ashraf	BS	2017-21	Walnut shell biochar for Cr(VI) removal from aqueous solution	Supervisor
Nazim Mushtaq Mehroz Khan	BS	2017-21	Arsenic Contamination and Human Health Risk Assessment in Groundwater near River Ravi, Lahore, Pakistan	Supervisor

Muhammad Sohail Sattar	M Phil	2016-18	Arsenite and arsenate immobilization in aqueous solutions using peanut shell derived biochar	Member Supervisory Committee
Rameez Anjum	M Phil	2016-2018	Sorption of arsenite and arsenate by almond shell derived biochar from aqueous environments	Member Supervisory Committee
Hafiz Muhammad Yousaf haroon,	M Phil	2016-2018	Role of wheatstraw and pressmud biochars in chromium sorption from wastewater	Member Supervisory Committee