Dr. Engr. Muhammad Sultan | PhD (Japan), Postdoc (Canada & Japan)
Associate Professor | Bahauddin Zakariya University, Multan (Pakistan)
Discipline | Agricultural Engineering (Major: Energy & Environmental Engineering)
World's Top 2% Scientist (2023) (Stanford University/Elsevier)
No. 1 Scientist in Agricultural Engineering (Pakistan) (AD Scientific Index)
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BZU | ResearchGate | Google Scholar | Scopus | ORCID | LinkedIn | Academia

Education	2019	Postdoc in Mechatronic Systems Engg. | Simon Fraser University, Canada
	2017	Postdoc in Energy & Environmental Engg. | Kyushu University, Japan
	2015	PhD in Energy & Environmental Engineering | Kyushu University, Japan
	2010	M.Sc. (Hons.) Agricultural Engg. | University of Agriculture, Faisalabad
	2008	B.Sc. Agricultural Engg. | University of Agriculture, Faisalabad

Summary of Academic Activities	Journal Articles	177
	Journal Articles as 1st/ corresponding author	92
	Cumulative Impact Factor	775
	Conference Publications	100+
	Books Edited/Authored	12 (completed); 2 (in progress)
	Book Chapters	22
	Editor Role (Journals)	18
	Editor Role (Books)	14
	Keynote/Invited/ TV Talks	30
	Reviewer of the International Journals	100+
	Session Chair/ TPC Committee in Int. Conferences	17
	Citations	4150
	h-index	35
	i10-index	100
PhD/Master Students supervised	M.Sc. (Hons.) Agricultural Engineering (Farm Machinery & Energy)	17 (completed) 06 (under supervision)
	Ph.D. Agricultural Engineering (Farm Machinery & Energy)	01 (completed) 04 (under supervision)

Research Projects

- 2023-25 | Reinventing Textile Wastewater Circular Economy.
  Funded GBP 450,000 by FCDO (United Kingdom)
- 2023-24| Hybrid energy powered smart irrigation system
  Funded GBP 300,000 by Innovate UK (United Kingdom)
- 2023-26| Energy-efficient control of greenhouse temperature/humidity
  Funded PKR 5.0 million by HEC (Pakistan)
- 2023-26| Sewage sludge management with energy/organic fertilizer production
  Funded PKR 8.5 million by HEC (Pakistan)
- 2023-26| Shelf-life enhancement of tomatoes by solar storage system
  Funded PKR 4.5 million by HEC (Pakistan)
- 2023-25| Design and development of self-propelled sprayer for paddy crop
  Funded PKR 5.0 million by HEC (Pakistan)

Research Technologies	Heat pump systems, desiccant air-conditioning, evaporative cooling, Maisotsenko cycle (M-cycle), adsorption cooling, HVAC systems, energy recovery ventilators, adsorption desalination, atmospheric water harvesting.
Research Applications	Greenhouse temperature/humidity control; fruits/vegetable storage; poultry/livestock air-conditioning; grains/dry fruit storage; wastewater treatment

Biography	Dr. Muhammad Sultan is an Associate Professor of Energy & Environmental Engineering at Agricultural Engineering Dept., Bahauddin Zakariya University, Multan (Pakistan). He did B.Sc. and M.Sc. in Agricultural Engineering with distinctions from the University of Agriculture Faisalabad (Pakistan). He completed his Ph.D. and Postdoctoral Research from Kyushu University (Japan) in the field of Energy & Environmental Engineering as an awardee of MEXT and JASSO fellowships, respectively. He also did Postdoctoral Research as a Canadian Queen Elizabeth Advance Scholar at Simon Fraser University (Canada) in the field of Mechatronic Systems Engineering. Dr. Sultan has been recognized as the World's Top 2% Scientists (2023) by Stanford University/Elsevier. He also ranked No. 1 Scientist in Pakistan in the field of Agricultural Engineering as per AD Scientific Index Ranking (2023). He is a Research Fellow at the University of South Africa (South Africa) and INTI International University (Malaysia). He worked for Kyushu University International Institute for Carbon-Neutral Energy Research (WPI-I2CNER) for two years. Currently, he is working on 7 research projects funded by the Pakistan Higher Education Commission, UK Research & Innovation, and UK Foreign, Commonwealth & Development Office. He has also completed five research projects in the field of agricultural engineering. He has supervised 17 M.Eng. and 1 Ph.D. thesis. He has published more than 177 journal articles with a cumulative impact factor of 775. In addition, he published 100+ conference articles, 22 book chapters, and 14 books. His research citations are 4150 along with an h-index of 35, and an i10-index of 100. He is serving in the Editor role for several SCI journals including AgriEngineering (IF 2.8), Agriculture (IF 3.6), Agronomy (IF 3.7), Sustainability (IF 3.9), Energies (IF 3.2), Water (IF 3.4), Advances in Mechanical Engineering (IF 2.1), Frontiers in Energy Research (IF 3.4), Environmental Research Communications (IF 2.9), Discover Sustainability (IF 2.6), and Journal of Agricultural Sciences (IF 0.9).

Journal Articles (selected)

Year	Details of Publication
2021-23	Aleem, M., et al. " Evaluating the emerging adsorbents for water production potential and thermodynamic limits of adsorption-based atmospheric water harvesting systems." International Communications in Heat and Mass Transfer. Vol 145, Part B (2023) 106863.
	Asfahan, Hafiz M., et al. "Evaluating the emerging adsorbents for performance improvement of adsorption desalination cum cooling system." International Communications in Heat and Mass Transfer 142 (2023): 106661.
	Asfahan, Hafiz M., et al. " Performance Evaluation of Phenol-Resin-Based Adsorbents for Heat Transformation Applications." Materials 2023, 16(15), 5262
	Ashraf, H, et al. " Spatiotemporal Estimation of Reference Evapotranspiration for Agricultural Applications in Punjab, Pakistan." Agriculture 2023, 13(7), 1388.
	Asfahan, Hafiz M., et al. "Recent development in adsorption desalination: A state of the art review." Applied Energy 328 (2022): 120101.
	Sultan, Muhammad, et al. "Energy Systems and Applications in Agriculture." Energies 15.23 (2022): 9132.
	Bilal, Muhammad, et al. "Adsorption-based atmospheric water harvesting: A review of adsorbents and systems." Int. Communications in Heat and Mass Transfer 133 (2022): 105961.
	Bilal, Muhammad, et al. "Investigating Adsorption-Based Atmospheric Water Harvesting Potential for Pakistan." Sustainability 14.19 (2022): 12582.
	Hussain, Ghulam, et al. "Evaluating evaporative cooling assisted solid desiccant dehumidification system for agricultural storage application." Sustainability 14.3 (2022): 1479.
	Ashraf, Hadeed, et al. "Potential Investigation of Membrane Energy Recovery Ventilators for the Management of Building Air-Conditioning Loads." Energies 15.6 (2022): 2139.
	Riaz, Nadia, et al. "Recent developments in adsorption heat pumps for heating applications." Advances in Mechanical Engineering 14.4 (2022): 16878132221089444.
	Wasti, Tanzeela Z., et al. "An overview of solid and liquid materials for adsorption-based atmospheric water harvesting." Advances in Mechanical Engineering 14.3 (2022).
	Riaz, Nadia, et al. "A review of recent advances in adsorption desalination technologies." International Communications in Heat and Mass Transfer 128 (2021): 105594.

	Ashraf, Sahrish, et al. "Recent progress on water vapor adsorption equilibrium by metal-organic frameworks for heat transformation applications." International Communications in Heat and Mass Transfer 124 (2021): 105242.
	Raza, Hafiz MU, et al. "Experimental investigation of evaporative cooling systems for agricultural storage and livestock air-conditioning in Pakistan." Building simulation. Vol. 14. Tsinghua University Press, 2021.
	Shahzad, Khawar, et al. "Experiments on energy-efficient evaporative cooling systems for poultry farm application in Multan (Pakistan)." Sustainability 13.5 (2021): 2836.
	Ashraf, Hadeed, et al. "Dynamic evaluation of desiccant dehumidification evaporative cooling options for greenhouse air-conditioning application in Multan (Pakistan)." Energies 14.4 (2021): 1097.
	Asfahan, Hafiz M., et al. "Artificial intelligence for the prediction of the thermal performance of evaporative cooling systems." Energies 14.13 (2021): 3946.
2018-20	Shabir, Faizan, et al. "Recent updates on the adsorption capacities of adsorbent-adsorbate pairs for heat transformation applications." Renewable and Sustainable Energy Reviews 119 (2020): 109630.
	Shabir, Faizan, et al. "Steady-State Investigation of Carbon-Based Adsorbent–Adsorbate Pairs for Heat Transformation Application." Sustainability 12.17 (2020): 7040.
	Noor, Shazia, et al. "Evaporative cooling options for building air-conditioning: A comprehensive study for climatic conditions of Multan (Pakistan)." Energies 13.12 (2020): 3061.
	Kashif, Muhammad, et al. "Study on desiccant and evaporative cooling systems for livestock thermal comfort: Theory and experiments." Energies 13.11 (2020): 2675.
	Aleem, Muhammad, et al. "Experimental investigation of desiccant dehumidification cooling system for climatic conditions of Multan (Pakistan)." Energies 13.21 (2020): 5530.
	Raza, Hafiz MU, et al. "Investigating applicability of evaporative cooling systems for thermal comfort of poultry birds in Pakistan." Applied Sciences 10.13 (2020): 4445.
	Sultan, Muhammad, et al. "Adsorption of Difluoromethane (HFC-32) onto phenol resin based adsorbent: Theory and experiments." Int. Journal of Heat & Mass Transfer 127 (2018): 348-356.
	Sultan, Muhammad, et al.. "Optimization of adsorption isotherm types for desiccant air-conditioning applications." Renewable Energy 121 (2018): 441-450.
	Sultan, M, et al. "Performance evaluation of hydrophilic organic polymer sorbents for desiccant air-conditioning applications." Adsorption Science & Technology 36.1-2 (2018): 311-326.
2015-17	Sultan, M, et al. "Steady-state investigation of water vapor adsorption for thermally driven adsorption based greenhouse air-conditioning system." Renewable Energy 86 (2016): 785-795.
	Sultan, M, et al. "Steady-state investigation of water vapor adsorption for thermally driven adsorption based greenhouse air-conditioning system." Renewable Energy 86 (2016): 785-795.
	Sultan, Muhammad, et al. "Water vapor sorption kinetics of polymer based sorbents: Theory and experiments." Applied Thermal Engineering 106 (2016): 192-202.
	Mahmood, Muhammad H., et al. "Overview of the Maisotsenko cycle–A way towards dew point evaporative cooling." Renewable and sustainable energy reviews 66 (2016): 537-555.
	Sultan, Muhammad, et al. "Insights of water vapor sorption onto polymer based sorbents." Adsorption 21 (2015): 205-215.
	Sultan, Muhammad, et al. "An overview of solid desiccant dehumidification and air conditioning systems." Renewable and Sustainable Energy Reviews 46 (2015): 16-29.

Books (selected)

Year	Details of Book
2023	Sultan, M, et al. "Advances in Agricultural Engineering Technologies and Application". ISBN [Vol 1]: 978-3-0365-9375-3; ISBN [Vol 2]: 978-3-0365-9377-7. Published by MDPI.
	Sultan, M, et al. "Irrigation – New Perspectives" (ISBN: 978-1-83769-058-9). Published by IntechOpen Publisher, United Kingdom.
2022	Sultan, M, et al. "Irrigation and Drainage - Recent Advances" (ISBN: 978-1-80356-210-0). Published by IntechOpen Publisher, United Kingdom.
	Sultan, M, et al. "Sustainable Agricultural Engineering Technologies and Applications". ISBN 978-3-0365-5890-5. Published by MDPI.

	Sultan, M, et al. "Energy Systems and Applications in Agriculture". ISBN 978-3-0365-5008-4. Published by MDPI.
2021	Sultan, M, et al. "Energy-Efficient Systems for Agricultural Applications". ISBN: 978-3-030-86394-4. Published by Springer Nature
	Sultan, M, et al. "Sustainable Agricultural, Biological, and Environmental Engineering Applications". ISBN# 978-3-0365-2921-9. Published by MDPI.

Book Chapters (selected)

Year	Details of Book Chapter
2023	Asif, M, et al. " Disaster Risk Reduction Through Agricultural Engineering Technologies." In Disaster Risk Reduction in Agriculture. Springer Nature (2023): Chapter 23.
2022	Aleem M, et al. "Desiccant Dehumidification Cooling System for Poultry Houses in Multan (Pakistan)." In Energy-Efficient Systems for Agri. Applications. Springer Nature (2022): 19-42.
	Ullah, HS, et al. "Evaporative Cooling and Desiccant Dehumidification Air Conditioning Options for Livestock Thermal Comfort." In Energy-Efficient Systems for Agricultural Applications. Springer Nature (2022): 43-63.
	Ishaq, M, et al. "Desiccant Dehumidification System for Storage of Fruits and Vegetables." In Energy-Efficient Systems for Agricultural Applications. Springer Nature (2022): 65-83.
	Asfahan, HM, et al. "Agrovoltaic and Smart Irrigation: Pakistan Perspective." In Irrigation and Drainage-Recent Advances. IntechOpen (2022).
	Sultan, M, et al. "Energy-Efficient Humidity Pump System for Poultry Houses." In Synergy Development in Renewables Assisted Multi-Carrier Systems. Springer Nature (2022): 431-457.
2021	Sultan, M, et al. "Adsorption-based atmospheric water harvesting: Technology fundamentals and energy-efficient adsorbents." In Technology in Agriculture. IntechOpen (2021): 369.
2021	Sultan, M, et al. "Temperature and humidity control for the next generation greenhouses: Overview of desiccant and evaporative cooling systems." In Next-Generation Greenhouses for Food Security. IntechOpen (2021).
2020	Sultan, M, et al. "Investigation of desiccant and evaporative cooling systems for animal air-conditioning." Low-Temperature Technologies. IntechOpen, UK (2020): 21-37.