Dr. Engr. Muhammad Sultan | PhD (Japan), Postdoc (Canada & Japan)
Associate Professor | Bahauddin Zakariya University, Multan (Pakistan)
Discipline | Agricultural Engineering (Specialization: Energy & Env. Engineering)
World's Top 2% Scientist (2023 to date) (Stanford University/Elsevier)
No. 1 Scientist in Agricultural Engineering (Pakistan) (AD Scientific Index)
Associate Editor: Nature Portfolio Journal – npj Thermal Science & Engineering
Research Fellow: University of South Africa, South Africa
Research Fellow: INTI International University, Malaysia

URL Links	BZU (Pakistan) | LinkedIn | ResearchGate | Google Scholar | Scopus | ORCID | Publons | SciProfiles | CORE (Canada) | ResearcherID/Web of Science | Academia
Contact Information	PEC# AGRI-2711; Mobile# (+92) 0333-610 8888 ; WeChat/Skype: SultanBZU Emails: **M**uhammad**S**ultan@bzu.edu.pk ; **S**ultan@kyudai.jp Address: Agricultural Engineering Dept., Bahauddin Zakariya University, Multan, Pakistan. https://profiles.bzu.edu.pk/**M**uhammad**S**ultan

Education History

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

Employment History

2022-date	**Associate Professor** of Energy & Env. Engineering | Department of Agricultural Engineering, Bahauddin Zakriya University, Multan.
2016-22	**Assistant Professor** of Energy & Env. Engineering | Department of Agricultural Engineering, Bahauddin Zakriya University, Multan
2009-16	**Lecturer** | Department of Agricultural Engineering, Bahauddin Zakriya University, Multan

Additional Experience

2023-date	Research Fellow | University of South Africa (UNISA), **South Africa**
2023-date	Research Fellow | INTI International University, **Malaysia**
2019	Researcher | CORE Energy Recovery Solution Inc., Vancouver, **Canada**
2017-24	Professional Consultant | Adaptive AgroTech International, Potsdam, **Germany**
2014-16	Research Support Staff | Int. Institute for Carbon-Neutral Energy Research (WPI-I²CNER), Fukuoka, **Japan**

Research Projects/ Grants (since 2022)

International Projects/ Grants

- 2025-28 \| Super-efficient Sustainable Cooling Solution for All Applications.
  Funded GBP 2,800,000 by **UKRI, UK** (United Kingdom)
- 2024-26 \| Reinventing Textile Wastewater Circular Economy.
  Funded GBP 450,000 by **FCDO, UK** (United Kingdom)
- 2023-24\| Hybrid energy powered smart irrigation system
  Funded GBP 300,000 by Innovate UK, **UKRI, UK** (United Kingdom)

National Projects/ Grants

- 2022-25\| 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)

Summary of Academic Activities	Journal Articles	212
	Journal Articles (1st/ Corresponding Author)	110
	Cumulative Impact Factor	1000+
	Books	21
	Book Chapters	40
	Conference Publications	132
	Editor Role (Journals)	20
	Editor Role (Books)	21
	Awards and Distinctions	30
	Keynote/Invited/ TV/ Radio Talks	60
	Reviewer of the International Journals	115
	Session Chair/ TPC Committee in Int. Conferences	20
	Citations	9000+
	h-index	50
	i10-index	170
Postdoctoral/ Doctoral/ Master Students Supervised	Postdoctoral Candidates in Agri-Engineering (Major: Energy & Environmental Engineering)	03 (under supervision)
	Ph.D. Agricultural Engineering (Major: Energy & Environmental Engineering)	03 (completed) 05 (under supervision)
	M.Sc. (Hons.) Agricultural Engineering (Major: Energy & Environmental Engineering)	22 (completed) 03 (under supervision)
Editor Role in International Journals (Associate Editor, Regional Editor, Topic Editor, Section Editor, Guest Editor)	▪ Nature Portfolio Journal – npj Thermal Science and Engineering ▪ International Journal of Food Science –Wiley Journal, Impact Factor 3.1 ▪ AgriEngineering (ISSN 2624-7402), Impact Factor 2.8 ▪ Energies (ISSN 1996-1073), Impact Factor 3.2 ▪ Entropy (ISSN 1099-4300), Impact Factor 2.0 ▪ Sustainability (ISSN 2071-1050), Impact Factor 3.9 ▪ Agriculture (ISSN 2077-0472), Impact Factor 3.6 ▪ Agronomy (ISSN 2073-4395), Impact Factor 3.7 ▪ Water (ISSN 2073-4441), Impact Factor 3.4 ▪ Environmental Research Communications (ISSN 2515-7620), Impact Factor 2.9 ▪ Discover Sustainability (ISSN 2662-9984), Impact Factor 2.6 ▪ Advances in Mechanical Engineering (ISSN 1687-8140), Impact Factor 2.1 ▪ Journal of Agricultural Sciences-Tarim Bilimleri Dergisi, Impact Factor 0.9 ▪ Frontiers in Energy Research (ISSN 2296-598X), Impact Factor 3.4 ▪ Crops (ISSN 2673-7655), Impact Factor 1.9	
International Exposure	▪ UK (2025) ▪ Malaysia (2024) ▪ Saudi Arabia (2022) ▪ China (2019) ▪ Canada (2019) ▪ China (2018) ▪ Japan (2017) ▪ USA (2015) ▪ South Korea (2014) ▪ Japan (2012 – 2015)	
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 the Agricultural Engineering Department of Bahauddin Zakariya University, Multan, Pakistan. He earned his B.Sc. and M.Sc. degrees in Agricultural Engineering with distinction from the University of Agriculture Faisalabad, Pakistan. Dr. Sultan completed his Ph.D. and Postdoctoral Research in Energy & Environmental Engineering at Kyushu University, Japan, where he was a recipient of the MEXT and JASSO fellowships. He furthered his expertise with Postdoctoral Research in Mechatronic Systems Engineering at Simon Fraser University, Canada, as a Canadian Queen Elizabeth Advanced Scholar.	

	Dr. Sultan is a Research Fellow at the University of South Africa and INTI International University, Malaysia. His previous experience includes at WPI-I2CNER — International Institute for Carbon-Neutral Energy Research, Japan, and CORE, Canada. Recognized as one of the World's Top 2% Scientists (2023 to date) by Stanford University/ Elsevier, Dr. Sultan is also ranked #1 Scientist in Pakistan in the field of Agricultural Engineering according to the AD Scientific Index Ranking (2022 to date). Additionally, he is globally placed in the Top 0.3% of Scholars and #15th Scientist in Agricultural Engineering), as per the recent ScholarGPS Ranking. He has also been honored with several awards in recognition of his outstanding research contributions. Currently, Dr. Sultan is engaged in several research projects funded by the UK Research & Innovation, the UK Foreign, Commonwealth & Development Office, and the Pakistan Higher Education Commission. He has also completed several research projects in Agricultural and Energy Engineering. His supervision portfolio includes 03 Postdoctoral candidates, 08 PhD candidates, and 25 M.Eng. candidates. Dr. Sultan has authored 212 journal articles with a cumulative impact factor of 1000+, alongside 132 conference papers, 40 book chapters, and 21 books. His research has garnered 9000+ citations, an h-index of 50, and an i10-index of 170. He serves as an editor for 20 international journals, including npj Thermal Science and Engineering (Nature Portfolio Journal), AgriEngineering (IF 2.8), Energies (IF 3.2), Entropy (IF 2.0), Sustainability (IF 3.9), Environmental Research Communications (IF 2.9), Discover Sustainability (IF 2.6), Agriculture (IF 3.6), Agronomy (IF 3.7), Water (IF 3.4), Advances in Mechanical Engineering (IF 2.1), and Frontiers in Energy Research (IF 3.4). His research primarily focuses on the energy aspects of various agricultural engineering technologies and applications, with keywords including evaporative cooling, desiccant air-conditioning, adsorption heat pumps, Maisotsenko cycles, adsorption desalination, atmospheric water harvesting, energy recovery ventilators, and wastewater treatment.

Journal Articles (selected only)

Year	Details of Publication
2024-25	Sultan, M., "Thermodynamic evaluation of advanced adsorbents for thermally-driven atmospheric water harvesting system in diverse climatic conditions ". Int Journal of Refrigeration Vol 177, 2025, PP 273-295.
	Sultan, M., "Emerging Agricultural Engineering Sciences, Technologies, and Applications". AgriEngineering, Vol 6(3), (2024), 2057-2066.
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 only)

Year	Details of Book
2025	Sultan, M, et al. (2025) "Air Conditioning Technologies and Applications". ISBN: 978-1-83769-975-9. Published by IntechOpen Publisher, United Kingdom.

2023-24	Sultan, M, et al. (2024) "Emerging Agricultural Engineering Sciences, Technologies, and Applications ". ISBN [Vol 1]: 978-3-7258-2712-1; ISBN [Vol 2]: 978-3-7258-2714-5. Published by MDPI.
	Sultan, M, et al. (2024) "Irrigation Systems and Applications". ISBN: 978-1-83769-058-9; Print ISBN: 978-1-83769-057-2; Pages 186. Published by IntechOpen Publisher, United Kingdom.
	Sultan, M, et al. (2023) "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. (2023) "Irrigation and Drainage - Recent Advances" (ISBN: 978-1-80356-210-0). Published by IntechOpen Publisher, United Kingdom.
2021-22	Sultan, M, et al. (2022) "Energy-Efficient Systems for Agricultural Applications". ISBN: 978-3-030-86394-4. Published by Springer Nature.
	Sultan, M, et al. (2022) "Sustainable Agricultural Engineering Technologies and Applications". ISBN 978-3-0365-5890-5. Published by MDPI.
	Sultan, M, et al. (2022) "Energy Systems and Applications in Agriculture". ISBN 978-3-0365-5008-4. Published by MDPI.
	Sultan, M, et al. (2021) "Sustainable Agricultural, Biological, and Environmental Engineering Applications". ISBN# 978-3-0365-2921-9. Published by MDPI.

Book Chapters (selected only)

Year	Details of Book Chapter
2024	Riaz N, et al. "Study on evaporative cooling assisted temperature and humidity control systems for greenhouse farming in Pakistan". In Air Conditioning Technologies and Applications. IntechOpen, UK (2024): Chapter 1.
	Aleem M, et al. "Hybrid Energy Powered Smart Irrigation System for Smallholder Farmers: Installation Site and Crop Selection". In Irrigation Systems and Applications. IntechOpen, UK (2024): Chapter 1.
2022-23	Asif, M, et al. " Disaster Risk Reduction Through Agricultural Engineering Technologies." In Disaster Risk Reduction in Agriculture. Springer Nature (2023): Chapter 23.
	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.
2020-21	Sultan, M, et al. "Adsorption-based atmospheric water harvesting: Technology fundamentals and energy-efficient adsorbents." In Technology in Agriculture. IntechOpen (2021): 369.
	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).
	Sultan, M, et al. "Investigation of desiccant and evaporative cooling systems for animal air-conditioning." Low-Temperature Technologies. IntechOpen, UK (2020): 21-37.