

Dr. Mohammad Kamruzzaman

Senior Scientific Officer (Grade 5)
Farm Machinery and Postharvest Technology Division
Bangladesh Rice Research Institute (BRRI), Gazipur-1701,
Bangladesh

and

Lead Author, IPCC Methodological Report 2027

**Contributing Author to Chapter 10 of the IPCC Working Group I
Seventh Assessment Report (AR7)**



Dr. Mohammad Kamruzzaman holds a PhD in Engineering from Gyeongsang National University, Republic of Korea, and MSc in Mechanical Engineering from Islamic University of Technology (IUT), Bangladesh. He also holds BSc in Agricultural Engineering from Bangladesh Agricultural University. His area of interest includes climate change impact assessment and adaptation, development of climate-smart agricultural technologies, and greenhouse gas modeling and mitigation. He is a Senior Scientific Officer by profession and has served at Bangladesh Rice Research Institute (BRRI) since 2004.

His experience includes working on projects related to climate-smart agriculture, precision agriculture through 4th Industrial Revolution, cropping system intensification in salt-affected coastal zones, and public-private blended finance facilities for climate-resilient rice landscapes. As Head of the Climate Smart Agriculture lab at BRRI, he has been actively involved in research on climate change adaptation, sustainable agricultural practices, and GHG emission reduction in rice cultivation. He serves as Lead Author for the IPCC Methodological Report 2027, contributing to international climate change assessment and policy development. He is also a **Contributing Author to Chapter 10 of the IPCC Working Group I Seventh Assessment Report (AR7)**. His contribution to Section 10.4, “Sectoral Climatic Impact-Drivers and Their Changes,” focuses on climatic impact-driver indices relevant to agriculture, water resources, and ecosystems. This work includes the assessment of drought, precipitation extremes, wet and dry spells, and other hydroclimatic indicators that connect physical climate changes with sectoral impacts, vulnerability, risk, and adaptation needs.

He serves as a member of various academic councils and holds positions as Part-time Faculty at the Department of Meteorology, University of Dhaka, and Adjunct Faculty at the Department of Agrometeorology, Bangabandhu Sheikh Mujibur Rahman Agricultural University. He is also an Academic Council member at Kurigram Agricultural University. Dr. Kamruzzaman has extensive experience in FAO technical assistance projects and has recently contributed to the Transforming Bangladesh Agriculture: Outlook 2050 project.

Dr. Mohammad Kamruzzaman is an Associate Editor of Earth System and Environment (Impact Factor: 5.3) and has published over 50 research papers in ISI-indexed journals. He strongly believes in evidence-based agricultural research and sustainable development. Currently, he is working as Senior Scientific Officer at Farm Machinery and Postharvest Technology Division, Bangladesh Rice Research Institute, Gazipur-1701, Bangladesh. His research profiles can be accessed via [Google Scholar](#) | [ResearchGate](#) | [LinkedIn](#)

CURRICULUM VITAE

Name	DR. MOHAMMAD KAMRUZZAMAN
Date of Birth:	1 November 1976
Nationality	BANGLADESHI
Postal Address	Farm Machinery and Postharvest Technology Division, Bangladesh Rice Research Institute (BRRI), Gazipur-1701, Bangladesh
Mobile/ Phone#	+880 177 642 2808
E-mail	milonbrri@gmail.com

Education	• PhD in Engineering (2020), CGPA (4.13/4.5), Gyeongsang National University, Republic of Korea • MSc in Mechanical Engineering (2011), CGPA (3.88/4.00), Islamic University of Technology (IUT), Gazipur, Bangladesh • BSc in Agricultural Engineering (1998), Second Class, Bangladesh Agricultural University, Mymensingh
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Research Interests	– Climate change impact assessment and adaptation – Development of climate-smart agricultural technologies – Greenhouse gas modeling and mitigation
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PROFESSIONAL EXPERIENCES

Professional Experiences	26 Dec. 2012 to present Senior Scientific Officer Bangladesh Rice Research Institute (BRRI), Gazipur-1701, Bangladesh Propose, plan, execute and manage research projects, report preparation, and presentation of findings. 24 June 2004 to 25 Dec. 2012 Scientific Officer Bangladesh Rice Research Institute (BRRI), Gazipur-1701, Bangladesh Propose, plan, execute and manage research projects, report preparation, and presentation of findings.
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Academic Positions	• Part-time Faculty, Department of Meteorology, University of Dhaka • Adjunct Faculty, Department of Agrometeorology, Gazipur Agricultural University • Academic Council Member, Kurigram Agricultural University, Kurigram
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International Appointments	Lead Author, IPCC Methodological Report 2027 Intergovernmental Panel on Climate Change (IPCC)
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	Contributing to the development of methodological guidance for climate change assessment, greenhouse gas inventories, and climate change mitigation strategies at the international level.
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Skills	- Advanced proficiency in R and Python - Expertise in GIS, remote sensing, and hydrological modeling - Project management and cross-functional team leadership
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CONSULTANCY EXPERIENCE

Consultancy Experience	National Senior Climate Change Expert, FAO Bangladesh (2026) • GEF-8 project on integrated management of Ecologically Critical Areas (ECAs) • Supported climate vulnerability and risk assessments for Jaflong-Dawki, Cox's Bazar-Teknaf Peninsula, and Sonadia ECAs • Integrated climate risks into ecosystem-based management and nature-based solutions, aligned with BCCSAP, NAP, NDC, and Delta Plan 2100 • Contributed to GHG mitigation and adaptation co-benefit estimation, climate indicators, policy briefs, and technical documentation FAO Climate Change Expert (2025) • Transforming Bangladesh Agriculture – Outlook 2050: Climate Smart Agriculture & Resilient Financing • Assessed climate hazards and CSA adoption gaps across agro-ecological zones of Bangladesh • Developed a CSA and Resilient Financing Roadmap (2025–2050) aligned with NDC and SDG targets • Delivered outputs including CSA gap analysis, climate risk mapping, resilient finance framework, and investment recommendations for FAO and national stakeholders
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Project Leadership & Management	• Head: Climate Smart Agriculture lab, FMPHT Division, Bangladesh Rice Research Institute • Deputy Project Director: Farm Machinery Development and Dissemination (2012–2015) • Project Director: Dissemination of Prilled Urea Applicator • Focal Point: Public-Private Blended Finance Facility for Climate-Resilient Rice Landscapes (GCP/RAS/906/LDF and GCP/RAS/906/SCF) - FAO funded Project • Project Scientist: Cropping system intensification in the salt-affected coastal zones of Bangladesh and West Bengal, India (LWR/2014/073) funded by ACIAR and ICAR • Working Scientist: PARTNER Project (World Bank funded) on Precision agriculture through 4th Industrial Revolution • Contributor: World Bank-funded Climate Innovation Challenge (CIC) project on Integrated Pest Management Using Seamless Climate Information
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PUBLICATIONS

Dr. Kamruzzaman has published 56 research papers in ISI-indexed journals. Selected publications include:

Recent Publications (2018-2025)	1. Kamruzzaman, M., Abdullah, A.Y.M., Islam, A.K.M.S., Talukder, A., Wahid, S. and Shahid, S. (2026) ‘Diurnal asymmetry in heat stress intensification across Bangladesh, 1985–2024: Accelerated nighttime warming and emerging urban risk’, <i>PLOS Climate</i>, 5(8), e0000848. doi: 10.1371/journal.pclm.0000848. 2. Kamruzzaman, M., Hasnat, J. & Bhuiyan, N.I. Season-specific drought hazard assessment in monsoon Bangladesh using an EDI-based composite index (1981–2018). <i>Theor Appl Climatol</i> 157, 459 (2026). https://doi.org/10.1007/s00704-026-06418-1 3. Kamruzzaman, M., Mainuddin, M., Karim, F., Wahid, S., Islam, H. M. T., M., Rashid, I. U., Khan, M. A. R., & Shahid, S. (2026). Seasonal variability and oceanic drivers of compound climate extremes in the coastal Ganges Delta (1971–2021). <i>Progress in Disaster Science</i>, Article 100624. https://doi.org/10.1016/j.pdisas.2026.100624 4. Hasan, M., Yildiz, S., & Kamruzzaman, M. (2026). Assessment of the GraphCast AI model for precipitation forecasting and its potential in extreme event prediction over Bangladesh. <i>PLOS Climate</i>, 5(6), e0000791. 5. Kamruzzaman, M.2026. “Spatial and Temporal Dynamics of Drought, Heatwave and Compound Extremes in Saudi Arabia From 1984 to 2023: A Comprehensive Analysis.” <i>International Journal of Climatology</i>70404. https://doi.org/10.1002/joc.70404. 6. M. Kamruzzaman, S.M.M. Kamal, A. Talukder, F.C. Jain, A.K.M. Raisul Alam Khan, Md.Mizanur Rahman, Md. Asaduzzaman, S. Shahid, High-resolution WBGT-based assessment of urban heat stress in Dhaka, Bangladesh (2008–2017): implications for climate-responsive planning, <i>City and Environment Interactions</i> (2026), doi: https://doi.org/10.1016/j.cacint.2026.100329 7. Kamruzzaman, M., Islam, H.M.T., Talukder, A. <i>et al.</i> Cropland exposure to projected future changes in diurnal temperature range across Bangladesh. <i>Theor Appl Climatol</i> 157, 144 (2026). https://doi.org/10.1007/s00704-026-06084-3 8. Sarkar, S., Gaydon, D. S., Kamruzzaman, M., Mainuddin, M., Dhar, A., Dey, S., & Brahmachari, K. (2025). Climate-smart management of rice–pulse rotations in complex coastal saline ecosystems: An APSIM assessment. <i>Agricultural Systems</i>, 230, 104473. https://doi.org/10.1016/j.agry.2025.104473 9. Islam, H. M. T., Ahmed, S., Kamruzzaman, M., Kumar, V., & Bhandari, H. (2025). Impact of rainfall variability and extremes on crop intensification and diversification in the coastal region of Bangladesh. <i>Environmental and Sustainability Indicators</i>, 27, 100813. https://doi.org/10.1016/j.indic.2025.100813 10. Islam, H. M. T., Mainuddin, M., Affan, A., Ahmed, S., Rahman, M. A., Sadeque, A., Almazroui, M., Rahman, S. M. H., & Kamruzzaman, M. (2025). Thermal bioclimatic transformations in the coastal regions of Ganges delta: Insights from CMIP6 multi-model ensemble. <i>Scientific Reports</i>, 15, 20569. https://doi.org/10.1038/s41598-025-04149-3 11. Nazrul, F. B., Karim, M. R., Pavan, W., & Kamruzzaman, M. (in press) Future Climate Extremes in Bangladesh: Insights from a Multi-Model Ensemble of CMIP6 Simulations. <i>Earth Systems and Environment</i>
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12. **Kamruzzaman, M.**, Wahid, S., Mainuddin, M., Chiew, F., Islam, A.R.M.T., Hamed, M.M., Thorp, K.R. and Shahid, S. (2025), Advancements in Extreme Precipitation Projections for South Asia: A Comparative Evaluation of CMIP5 and CMIP6 Models. *Int J Climatol* e8915. <https://doi.org/10.1002/joc.8915>
13. Talukder, A., Shaid, S., Hwang, S., Alam, E., Islam, K., & **Kamruzzaman, M.** (2025). Optimizing the multi-model ensemble of CMIP6 GCMs for climate simulation over Bangladesh. *Scientific Reports*, 15(1), 11343.. <https://doi.org/10.1038/s41598-025-96446-0>
14. Rifat Ara Mishu, Javed Mallick, Mst Yeasmin Akter, Md. Abdul Fattah, **Mohammad Kamruzzaman**, Mohammed Abdus Salam, Subodh Chandra Pal, Abu Reza Md. Towfiqul Islam; Spatial and temporal variability of future extreme precipitation in Bangladesh using CMIP6 models. *Journal of Water and Climate Change* 2025; jwc2025415. doi: <https://doi.org/10.2166/wcc.2025.415>
15. Khan, N., **Kamruzzaman, M.** and Shahid, S. (2025), Diurnal Pattern of Heat Stress Over South Asia: A Wet Bulb Globe Temperature-Based Analysis From 1984 to 2023. *Int J Climatol* e8797. <https://doi.org/10.1002/joc.8797>
16. Mandal, U.K., Karim, F., Yu, Y., Ghosh, A., Zahan, T., Mallick, S., **Kamruzzaman, M.**, Paul, P.L.C. and Mainuddin, M., 2025. Assessing vulnerability and climate risk to agriculture for developing resilient farming strategies in the Ganges Delta. *Climate Risk Management*, p.100690.
17. Rahman, M., **Kamruzzaman, M.**, Deb, L., & Islam, H. T. (2024). Flood mapping, damage assessment, and susceptibility zonation in northeastern Bangladesh in 2022 using geospatial datasets. *Progress in Disaster Science*, 100402.
18. **Kamruzzaman, M.**, Shozib, H. B., Kader, M. A., Iftekharuddaula, K. M., Rahman, M. A., Lipi, L. F., ... & Kabir, M. S. (2024). Progress of healthier rice development in Bangladesh: A review. *Journal of Food Composition and Analysis*, 107082.
19. Tiwari V, Thorp K, Tulbure MG, Gray J, **Kamruzzaman M**, Krupnik TJ, et al. (2024) Advancing food security: Rice yield estimation framework using time-series satellite data & machine learning. *PLoS ONE* 19(12): e0309982. <https://doi.org/10.1371/journal.pone.0309982>
20. **Kamruzzaman, M.**, Islam, H.M.T., Rahman, M.S. *et al.* Assessing the impacts of future climate extremes on *boro* rice cultivation in the northeastern Haor region of Bangladesh: insights from CMIP6 multi-model ensemble projections. *Theor Appl Climatol* 156, 3 (2025). <https://doi.org/10.1007/s00704-024-05270-5>
21. **Kamruzzaman, M.**, Bhattacharjya, D. K., Alam, E., Karim, M. R., Nath, B., Al Hattawi, K. S., & Islam, M. K. (2024). Thermochemical and physical characterization of agricultural biomass for sustainable energy in Bangladesh. *Energy Reports*, 12, 5758-5768.
22. **Kamruzzaman, M.**, Shariot-Ullah, M., Islam, R., Amin, M. G. M., Islam, H. M. T., Ahmed, S., ... & Shahid, S. Projections of future bioclimatic indicators using bias-corrected CMIP6 models: a case study in a tropical monsoon region. *Environmental science and pollution research international*.
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 29. **Kamruzzaman**, M., Islam, H.M.T., Ahmed, S. *et al.* Evaluating the Effects of Climate Change on Thermal Bioclimatic Indices in a Tropical Region Using Climate Projections from the Bias-Corrected CMIP6 Model. *Earth Syst Environ* 7, 699–722 (2023). <https://doi.org/10.1007/s41748-023-00360-2>
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 32. Kyaw, A. K., Hamed, M. M., **Kamruzzaman**, M., & Shahid, S. (2023). Spatiotemporal Changes in Population Exposure to Heat Stress in South Asia. *Sustainable Cities and Society*, 104544.
 33. Islam, H. M., **Kamruzzaman**, M., Shahid, S., Mainuddin, M., Alam, E., Islam, A. R., Biswas, J. C., & Islam, M. A. (2023). Spatiotemporal changes in temperature projections over Bangladesh using multi-model ensemble data. *Frontiers in Environmental Science*, 10. <https://doi.org/10.3389/fenvs.2022.1074974>
 34. **Mohammad Kamruzzaman**, Shahriar Wahid, Shamsuddin Shahid, Edris Alam, Mohammed Mainuddin, HM Touhidul Islam, Jeapil Cho, Md Mizanur Rahman, Jatish Chandra Biswas, and Kelly R. Thorp. "Predicted changes in future precipitation and air temperature across Bangladesh using CMIP6 GCMs." *Heliyon* 9, no. 5 (2023).
 35. **Mohammad Kamruzzaman**, MA Salam, Anarul Haque Mondol, Limon Deb, Polash Kumar, Md. Asad Uz zaman, Abu Reza

- Md.Toufiqul Islam. Spatiotemporal drought analysis in Bangladesh using the standardized precipitation index (SPI) and standardized precipitation evapotranspiration index (SPEI). *Sci Rep* 12, 20694 (2022). <https://doi.org/10.1038/s41598-022-24146-0>
36. Hafijur Rahaman, Md. Mizanur Rahman, A. K. M. Saiful Islam, Md. Durrul Huda & **Mohammad Kamruzzaman**. 2022. Mechanical Rice Transplanting in Bangladesh: Current Situation, Technical Challenges, and Future Approach. *J. Biosyst. Eng.* (2022). <https://doi.org/10.1007/s42853-022-00161-x>
 37. Das, S.; **Kamruzzaman, M.**; Md, A.R.; Zhu, D.; Kumar, A. Comparison of Future Changes in Frequency of Climate Extremes Between Coastal and Inland Locations of Bengal Delta Based on CMIP6 Climate Models. *Atmosphere* 2022, 13, x. <https://doi.org/10.3390/xxxxx>
 38. Biswas, J.C.; Haque, M.M.; Hossain, M.B.; Maniruzzaman, M.; Zahan, T.; Rahman, M.M.; Sen, R.; Ishtiaque, S.; Chaki, A.K.; Ahmed, I.M.; Akhtar, S.; Ahmmmed, F.; Hossain, M.F.; Akhter, S.; **Kamruzzaman, M.**; Biswas, J.K.; Alsuhaibani, A.M.; Gaber, A.; Hossain, A. Seasonal Variations in Grain Yield, Greenhouse Gas Emissions and Carbon Sequestration for Maize Cultivation in Bangladesh. *Sustainability* 2022, 14, 9144. <https://doi.org/10.3390/su14159144>
 39. Samiran Das, , Abu Reza Md. Towfiqul Islam and **Mohammad Kamruzzaman**. 2022. Assessment of climate change impact on temperature extremes in a tropical region with the climate projections from CMIP6 model. *Clim Dyn* (2022). <https://doi.org/10.1007/s00382-022-06416-9>
 40. Samiran Das, **Mohammad Kamruzzaman**, Abu Reza Md. Towfiqul Islam. 2022. Assessment of characteristic changes of regional estimation of extreme rainfall under climate change: A case study in a tropical monsoon region with the climate projections from CMIP6 model, *Journal of Hydrology*, Volume 610, 128002, <https://doi.org/10.1016/j.jhydrol.2022.128002>.
 41. Elbeltagi, Ahmed, Faisal AlThobiani, **Mohammad Kamruzzaman**, Shamsuddin Shaid, Dilip K. Roy, Limon Deb, Md M. Islam, Palash K. Kundu, and Md. M. Rahman. 2022. "Estimating the Standardized Precipitation Evapotranspiration Index Using Data-Driven Techniques: A Regional Study of Bangladesh" *Water* 14, no. 11: 1764. <https://doi.org/10.3390/w14111764>
 42. Rahman, Md. M., Faisal AlThobiani, Shamsuddin Shahid, Salvatore G.P. Virdis, **Mohammad Kamruzzaman**, Hafijur Rahaman, Md. A. Momin, Md. B. Hossain, and Emad I. Ghandourah. 2022. "GIS and Remote Sensing-Based Multi-Criteria Analysis for Delineation of Groundwater Potential Zones: A Case Study for Industrial Zones in Bangladesh" *Sustainability* 14, no. 11: 6667. <https://doi.org/10.3390/su14116667>
 43. H. M. Touhidul Islam1, Abu Reza Md. Towfiqul Islam, Shamsuddin Shahid, GM Monirul Alam, Jatish Chandra Biswas, Md. Mizanur Rahman, Dilip Kumar Roy, **Mohammad Kamruzzaman**. 2022. Future precipitation projection in Bangladesh using SimCLIM climate model: a multimodel ensemble approach. *International Journal of Climatology*, 1– 25. <https://doi.org/10.1002/joc.7605>.
 44. Javed Mallick, Roquia Salam, H. M. Touhidul Islam, Shamsuddin Shahid, **Mohammad Kamruzzaman**, Subodh Chandra Pal, Shakeel Ahmad Bhat, Ahmed Elbeltagi, Thiago Rangel Rodrigues, Sobhy M. Ibrahim, Abu Reza Md. Towfiqul Islam. 2022. Recent changes in temperature

- extremes in subtropical climate regions and the role of large-scale atmospheric oscillation patterns. *Theor Appl Climatol* (2022). <https://doi.org/10.1007/s00704-021-03914-4>
45. **Kamruzzaman, M.**, Shahid, S., Roy, D. K., Islam, A. R. M. T., Hwang, S., Cho, J., Zaman, M. A. U., Sultana, T., Rashid, T., & Akter, F. **2021**. Assessment of CMIP6 global climate models in reconstructing rainfall climatology of Bangladesh. *International Journal of Climatology*, 1–26. <https://doi.org/10.1002/joc.7452>
 46. **Kamruzzaman, M**, Shahid, S., Islam, A.T. et al. **2021**. Comparison of CMIP6 and CMIP5 model performance in simulating historical precipitation and temperature in Bangladesh: a preliminary study. *Theor Appl Climatol* 145, 1385–1406 (2021). <https://doi.org/10.1007/s00704-021-03691-0>
 47. A. S. M. Shanawaz Uddin, Najeebullah Khan, Abu Reza Md. Towfiqul Islam, **Mohammad Kamruzzaman** & Shamsuddin Shahid. **2021**. Changes in urbanization and urban heat island effect in Dhaka city. *Theor Appl Climatol* (2021). <https://doi.org/10.1007/s00704-021-03872-x>
 48. Abu Reza Md. Towfiqul Islam, Roquia Salam, Nilufa Yeasmin, **Mohammad Kamruzzaman**, Shamsuddin Shahid, Md. Abdul Fattah, ASM Shanawaz Uddin, Mohammad Hasan Shahariar, Md Anarul Haque Mondol, Deepak Jhahharia, Kuaanan Techato. **2021**. Spatiotemporal distribution of drought and its possible associations with ENSO indices in Bangladesh. *Arab J Geosci* 14, 2681. <https://doi.org/10.1007/s12517-021-08849-8>
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 50. H.M. Touhidul Islam, Abu Reza Md. Towfiqul Islam, Md. Abdullah-Al-Mahbub, Shamsuddin Shahid, Anjum Tasnuva, **Mohammad Kamruzzaman**, Zhenghua Hu, Ahmed Elbeltagi, Mohammad Mahbub Kabir, Mohammed Abdus Salam, Sobhy M. Ibrahim. **2021**. Spatiotemporal changes and modulations of extreme climatic indices in monsoon-dominated climate region linkage with large-scale atmospheric oscillation, *Atmospheric Research*, Volume 264, 105840, <https://doi.org/10.1016/j.atmosres.2021.105840>.
 51. Bonosri Ghose, Abu Reza Md. Towfiqul Islam, Roquia Salam, Shamsuddin Shahid, **Mohammad Kamruzzaman**, Samiran Das, Ahmed Elbeltagi, Mohammed Abdus Salam & Javed Mallick. **2021**. Rice yield responses in Bangladesh to large-scale atmospheric oscillation using multifactorial model. *Theor Appl Climatol* 146, 29–44. <https://doi.org/10.1007/s00704-021-03725-7>
 52. Bonosri Ghose, Abu Reza Md. Towfiqul Islam, **Mohammad Kamruzzaman**, Md. Moniruzzaman & Zhenghua Hu. **2021**. Climate-induced rice yield anomalies linked to large-scale atmospheric circulation in Bangladesh using multi-statistical modeling. *Theor Appl Climatol* 144, 1077–1099. <https://doi.org/10.1007/s00704-021-03584-2>
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Awards and Recognition	• Best Paper Award-2019 by the Korean Society of Agricultural Engineers • Best Poster Award: 1st International Conference on Agricultural Machinery and Bioresource Engineering (ICAMBE) 2025 • Full funded PhD Scholarship from Gyeongsang National University, South Korea
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Academic Service	• Associate Editor, <i>Earth Systems and Environment</i> — Impact Factor: 5.3.
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	• Topic Editor, <i>Compound Hydro-Climatic Extremes and Water Sustainability: Understanding Cascading Risks and Adaptation Pathways</i>, <i>Frontiers in Water</i>. • Graduate Student Supervision: Supervised MS-level research students affiliated with the Department of Meteorology, University of Dhaka; Islamic University of Technology (IUT); Gazipur Agricultural University (GAU); Bangladesh Agricultural University (BAU); and Jahangirnagar University (JU).
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Memberships of Professional Organizations	• Honorary Secretary, The Institution of Engineers, Bangladesh (IEB), Gazipur center • Member, Institution of Engineers Bangladesh • Member, Krishibid Institution Bangladesh
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Dr. Mohammad Kamruzzaman