

SAJJAD, Muhammad (PhD)

World top-2% Scientist 2025 (Environmental Sciences and Geography) | IPCC Chapter Scientist (AR7, WG-II, Chapter 2)

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Profile Links: [Personal Website](#) | [Official Website](#) | [Google Scholar](#) | [Scopus](#) | [ResearchGate](#) | [ORCID](#) | [LinkedIn](#) | [Frontiers](#)

ACADEMIC, RESEARCH (R&D), and PROFESSIONAL EXPERIENCES

• Chapter Scientist	IPCC AR7, WG-II, Chapter 2 (Vulnerabilities, Risks, and Impact)	Jan. 2026 – Present
• Res. Asst. Professor	Geography and Resource Management @ CUHK	Aug. 2025 – Present
• Res. Asst. Professor	Landscape Architecture @ The University of Hong Kong	Sep. 2024 – Aug. 2025
• Res. Asst. Professor	Dept. of Geography @ Hong Kong Baptist University	Mid-July 2021 – July 2024
• Senior Scientist	Intensel Limited (RTH-HKSTPC Programme)	March – Mid-July 2021
• Research Assistant	City University of Hong Kong (GCACIC)	Sep 2020 – Feb 2021
• Visiting Scholar	Princeton University, NJ, USA (CEE)	Sep 2018 – Aug 2019
• Teaching Assistant	City University of Hong Kong (SEE)	Sep 2017 – Oct 2020
• Jr. GIS Professional	The Urban Unit (USPMU), Lahore, Pakistan	Oct. 2013 – July 2015
• GIS Consultant (Part-time)	Punjab Emergency Services Rescue-1122 , Pakistan	Oct 2013 – Sep 2014

PROFESSIONAL CONSULTANCY EXPERIENCES

- *Thought Leadership* Writing on climate risks and their implications for business sectors & asset management industry
- *Task Force* on Climate/Nature-related Financial Disclosures (TCFD & TNFD), ESG, CSRD, Environmental Impact
- *Urban Risk & Resilience Analytics/Dashboards* for Climate Change Adaptation and Sustainable Development
- *Science-based Research and Reporting*, Scientific Content Production, and Sustainability Pathways
- *Current and Future Climate Risk Assessment and Reporting* (Floods, Typhoons, Droughts, Sea Level Rise)
- *Spatial Business Analysis* (Network, Service Area, Site Suitability, Incident Mapping, Land Management, etc.)

ADMINISTRATIVE & SUPERVISORY EXPERIENCES

- **Supervisor/ Advisor**— two PhD students as Principal Supervisor (2021-2024), a group of 7 MS Students, 20+ Undergraduate Final Year Projects
- **Core Participant:** Geography Impact Case for Research Assessment Exercise, University Grants Committee, HKBU, HKSAR (2021-2024)
- **Library Coordinator:** Acted as the library coordinator (2021-2024) for the Dept of Geography, HKBU
- **Internal Member** experience of Postgraduate Assessment Panel, HKBU (2021-2024)
- **Member:** Research Ethics Panel (2021-2024), HKBU, HKSAR
- **Lead Coordinator** for HK Electric Scholarships for Energy and Environmental Studies 2021/22, HKBU
- **Member** of the Smart Society Lab, HKBU (2021-2024)

ACADEMIC QUALIFICATIONS

- **2017-2020:** PhD, School of Energy & Environment (Specialization Geospatial Applications for Disasters), CityU Hong Kong
- **2018-2019:** Visiting Researcher, Department of Civil and Environmental Engineering, Princeton University, USA
- **2015-2017:** Master's in Natural Science (Marine Affairs), Xiamen University, Fujian, China. (*Excellence Award*)
- **2009-2013:** BS (Hons), Geography, GC University Faisalabad, Punjab, Pakistan (*Distinction, Gold Medalist*)

TEACHING SUBJECTS

- GRMD1402 Environmental Sustainability (*Undergraduate Faculty Package Course*)
- GRMD2221 Weather and Climate (*Undergraduate Core Course*)
- SEED6104 and SEED6204 Dissertation Part 1 & 2 (*Supervision of Master Capstone Projects*)
- SEED6305 Topical Study I in Environmental Design (*Geo-information Science for Resilient Cities*)
- GEOG4046 Remote Sensing and Image Interpretation (*Major Elective Geo-analytics*)
- GEOG2006 Earth Systems: Shaping Landscapes
- GEOG4087 Natural Resource Evaluation and Policy Approaches

ACHIEVEMENTS, FUNDING, and AWARDS

- (2026-2028) Transformative Experiential Learning: Coupled Generative-AI-VR Framework for Formative, Place-Based Education in the Context of Disaster Literacy—**413,623 HK\$ (Ref: 4171274) PI**
- (2026) CUHK Internationalisation Faculty Mobility Scheme Awardee (Outbound)
- (2022) Equipment Matching Fund for drone and virtual reality—**268,960 HK\$ (Ref: RC-EMF/21-22/07/SOSC) Co-PI**
- (2021-2022) Startup Grant (Tier 1) by The HKBU Research Committee—**100,000 HK\$ (Ref: RC-STARTUP/21-22/12) PI**
- (2021-2022) One-off Special Allowance Dept. of Geography, HKBU—**4,500 HK\$**
- (2021) Research Talent Hub Fund Awardee of the Innovation and Technology Commission, HKSAR—**459,667 HK\$**
- (2018-2019) Partial Research Activities Fund, CityU of Hong Kong—**30,000 HK\$**
- (2017-2020) Fully funded Hong Kong PhD Scholarship, CityU Hong Kong —~**576,000 HK\$**
- (2015-2017) Fully funded China Scholarship Council's Master Scholarship—~**86,500 HK\$**
- (2016) Award of Excellence and Cash Prize at Xiamen University, China for International Students—**5,000 RMB**
- (2016) Best paper presentation award at the research forum organized by the College of Environment and Ecology, Xiamen University, China, 2016
- (2013) Gold Medalist, First Class with Distinction in BS (Hons) Dept. of Geography, GC University Faisalabad, Pakistan
- (2012) Student of the Year at the Dept. of Geography, GC University Faisalabad, Pakistan

RESEARCH INTERESTS

- *Large Language Models*, Geo-AI & Machine Learning Applications to Environmental, Climate & Social Sciences
- *Traditional and Non-traditional Data Fusion* for Hazard Assessment and Disaster Risk Management
- *Environmental & Urban Systems Modelling (Health and Implications)* for Sustainability
- *Risk-Resilience-Sustainability Nexus*
- *Natural Hazards, Vulnerability & Climate Change Impacts*
- *Remote Sensing & Geographic Information Systems (Applications and Analytics)*
- *Geospatial Data Modelling & Analyses*

RESEARCH IMPACT

My research is cited in several policy documents by reputable organizations, including UNESCO, IPCC, and the World Bank. Refer to the following policy documents, for example.

- *The Sixth Assessment Report of the United Nations Intergovernmental Panel on Climate Change* (IPCC: March 20, 2023)
- *Evidence on the gendered impacts of extended school closures: a systematic review* (UNESCO: March 17, 2022)
- *Climate Modeling or Macroeconomic Policy: A Case Study for Pakistan* (World Bank: September 27, 2021)
- *'Building Back Better' in Practice: A Science-Policy Framework for a Green Economic Recovery after COVID-19* (World Bank: February 04, 2021)

SELECTED PEER-REVIEWED PUBLICATIONS (* CORRESPONDING AUTHOR, UNDERLINED SHOW ADVISEE)

- **Publications:** 45+ peer-reviewed papers, including 10 in top-tier high-impact journals in the field (*Science of the Total Environment*, *Sustainable Cities and Society*, *Earth's Future*, *Georisk*, *Environmental Impact Assessment Review*, and *Journal of Cleaner Production*) and others published in a broad range of journals in environmental science; 3 Book Chapters, and various conference abstracts (10+).
- **Currently, 7 manuscripts are under review in JCR-Q1-listed journals and 5 in preparation** in collaboration with researchers from Mainland China, the USA, Australia, Turkiye, Hong Kong, Pakistan, and Europe.
- **One invited Book Proposal** (single author—edited) is accepted for publication by Elsevier in 2026.
- **Google Scholar Citations** (as of February 2026): 1965, h-index: 27, i10-index: 39
- **7 Manuscripts under review in Reputed Journals**
 - 2 in *Environment Development and Sustainability* and 1 in *Annals of AAG* (Collaborative work with Mainland China colleagues where I am the corresponding author); 1 in *the International Journal of Disaster Risk Science*; 1 in *Scientific Data* (My PhD student's work); 1 in *Transactions in GIS*, 1 in *Geographical Journal*
- **5 Manuscripts in preparation to be submitted by June 2026**
 - **Target:** 2 in *Nature Sustainability*, 2 in *Earth's Future*, 1 in *Journal of Hydrology*

Peer-reviewed Book Chapters

- **Sajjad, M.***, Bashir, A., & Haq, W. (2025). Pakistan in the Face of Climate Change: Current State of Risks, Resilience and Sustainability. In *Challenge, Continuity, and Change in Pakistan* (pp. 279-296). Routledge.
- **Waleed, M., Sajjad M.*** (2023) Warming Cities in Pakistan: Evaluating Spatial-temporal Dynamics of Urban Thermal Field Variance Index under Rapid Urbanization. In: Cheshmehzangi, A., He, B., Sharifi, A., and Matzarakis, A. (eds) *Climate Change and Cooling Cities*. Springer. <https://link.springer.com/book/9789819936748>
- Akhtar, Z., **Sajjad, M.**, Imran, M., Ofli, F. (2023) Risk Mapping in Managing Flood Vulnerability in Disaster Management. In: Singh, A. (eds) *International Handbook of Disaster Research*. Springer, Singapore. https://doi.org/10.1007/978-981-16-8800-3_177-1
- **Sajjad M.*** (2020) Impacts, drivers, and future adaptation opportunities for a warming Pakistan: Learnings from an industrialized city. In: Leal Filho W., Luetz J., Ayal D. (eds) *Handbook of Climate Change Management*. Springer, Cham. http://doi.org/10.1007/978-3-030-22759-3_131-1.

Selected Publications in Refereed Journals

- Esen, F., Karadeniz, E., Sunbul, F., Adiguzel, A. D., & **Sajjad, M.** From Mapping to Decision Making: A hybrid Rule-Based and Machine Learning Framework for Spatial Land-Use Zoning. *Frontiers in Environmental Science*, 14, 1791582.
- Kaya, A. Y., **Sajjad, M.***, & Dedekorkut-Howes, A. (2025). Downscaling Urban Disaster Resilience: Toward Building-Scale Geo-Information Modeling and Machine Learning-Assisted Resilience Knowledge Systems. *Transactions in GIS*, 29(8), e70153.
- Rehman, A., **Sajjad, M.**, Lu, H., Lu, S., Cao, L., Han, Z., ... & Abbas, S. (2025). Exacerbating landslide risks under future climate change and land use scenarios: evidence from the Western Himalayas in Pakistan. *Geomatics, Natural Hazards and Risk*, 16(1), 2577170.
- Ahmad, J., Eisma, J. A., & **Sajjad, M.*** (2025). Significant Attribution of Urbanization to Triggering Extreme Rainfall in the Urban Core—A Case of Dallas–Fort Worth in North Texas. *Urban Science*, 9(8), 295. (**Invited Paper**)
- Luk, S. Y., & **Sajjad, M.*** (2025). From space to screen: Recent advances in remote sensing for mangrove valuation through a bibliometric lens. *Ocean & Coastal Management*, 269, 107844.
- **Sajjad, M.***, Raza, S. H., Haq, W., & Rubab, S. F. (2025). Modelling pandemic-induced spatially heterogeneous patterns in income shock, food insecurity and their driving factors: a case of Pakistan. *Environment, Development and Sustainability*, 1-19.
- **Waleed, M., & Sajjad, M.*** (2025). High-resolution flood susceptibility mapping and exposure assessment in Pakistan: An integrated artificial intelligence, machine learning and geospatial framework. *International Journal of Disaster Risk Reduction*, 121(10544), 2.
- **Waleed, M., Sajjad, M.*** (2024). Advancing flood susceptibility prediction: A comparative assessment and scalability analysis of machine learning algorithms via artificial intelligence in high-risk regions of Pakistan. *Journal Of Flood Risk Management*, 18(1), e13047.

- Rehman, A., **Sajjad, M.***, Song, J., Riaz, M. T., Mehmood, M. S., & Ahamad, M. I. (2024). Integrated Frequency Ratio-Analytical Hierarchy and Geospatial Techniques-based Earthquake Risk Assessment in Mountainous Cities: A Case from the Northwestern Himalayas. *Georisk: Assessment and Management of Risk for Engineered Systems and Geohazards*, 1-21.
- **Waleed, M., Sajjad, M.,*** & Shazil, M. S. (2024). Urbanization-led land cover change impacts terrestrial carbon storage capacity: A high-resolution remote sensing-based nation-wide assessment in Pakistan (1990–2020). *Environmental Impact Assessment Review*, 105, 107396.
- Zahra, A., Qureshi, R., **Sajjad, M. (equal contribution)**, Sadak, F., Nawaz, M., Khan, H. A., & Uzair, M. (2024). Current advances in imaging spectroscopy and its state-of-the-art applications. *Expert Systems with Applications*, 238.
- **Waleed, M., & Sajjad, M.*** (2023). On the emergence of geospatial cloud-based platforms for disaster risk management: a global scientometric review of Google Earth engine applications. *International journal of disaster risk reduction*, 104056.
- Akhtar, Z., Qazi, U., Sadiq, R., El-Sakka, A., **Sajjad, M.**, Ofli, F., & Imran, M. (2023, April). Mapping Flood Exposure, Damage, and Population Needs Using Remote and Social Sensing: A Case Study of 2022 Pakistan Floods. In Proceedings of the ACM Web Conference 2023 (pp. 4120-4128). (*A* Conference*)
- **Owolabi, T. A., & Sajjad, M.***. (2023). A global outlook on multi-hazard risk analysis: A systematic and scientometric review. *International Journal of Disaster Risk Reduction*, 103727.
- **Sajjad, M.***, Ali, Z. & Waleed, M. Has Pakistan learned from disasters over the decades? Dynamic resilience insights based on catastrophe progression and geo-information models. *Natural Hazards* (2023). <https://doi.org/10.1007/s11069-023-05976-1>.
- **Waleed, M., Sajjad, M.***, Shazil, M. S., Tariq, M., & Alam, M. T. (2023). Machine learning-based spatial-temporal assessment and change transition analysis of wetlands: An application of Google Earth Engine in Sylhet, Bangladesh (1985–2022). *Ecological Informatics*, 75, 102075.
- **Khoshnazar, A., Perez, G. C., & Sajjad, M.*** (2023). Characterizing spatial-temporal drought risk heterogeneities: a hazard, vulnerability and resilience-based modeling. *Journal of Hydrology*, 129321.
- **Mehmood, M. S.**, Rehman, A., **Sajjad, M.**, Zafar, Z., Zhai, S., & Qin, Y. (2023). Evaluating land use/cover change associations with urban surface temperature via machine learning and spatial modelling: past trends and future simulations in Dera Ghazi Khan, Pakistan. *Frontiers in Ecology and Evolution*.
- Bozeman, J. F., Chopra, S. S., James, P., **Sajjad, M.**, Cai, H., Tong, K., Carrasquillo, M., Rickenbacker, H., Nock, D., Ashton, W., Heidrich, O., Derrible, S., & Bilec, M. (2023). Three research priorities for just and sustainable urban systems: Now is the time to refocus. *Journal of Industrial Ecology*, 00, 1–13.
- **Waleed, M., Sajjad, M.***, Acheampong, A. O., & Alam, M. (2023). Towards Sustainable and Livable Cities: Leveraging Remote Sensing, Machine Learning, and Geo-Information Modelling to Explore and Predict Thermal Field Variance in Response to Urban Growth. *Sustainability*, 15(2), 1416.
- Zafar, Z., Mehmood, M. S., Shiyan, Z., Zubair, M., **Sajjad, M.**, & Yaochen, Q. (2023). Fostering deep learning approaches to evaluate the impact of urbanization on vegetation and future prospects. *Ecological Indicators*, 146, 109788.
- Shafi, A., Chen, S., Waleed, M., & **Sajjad, M.*** (2023). Leveraging machine learning and remote sensing to monitor long-term spatial-temporal wetland changes: Towards a national RAMSAR inventory in Pakistan. *Applied Geography*, 151, 102868.
- **Mehmood, M. S.**, Zafar, Z., **Sajjad, M.**, Hussain, S., Zhai, S., & Qin, Y. (2023). Time Series Analyses and Forecasting of Surface Urban Heat Island Intensity Using ARIMA Model in Punjab, Pakistan. *Land*, 12(1), 142.
- Kanwal, S., Ding, X., Wu, S., & **Sajjad, M.** (2022). Vertical ground displacements and its impact on erosion along the Karachi coastline, Pakistan. *Remote Sensing*, 14(9), 2054.
- **Sajjad, M.***, Raza, S. H., & Shah, A. A. (2022). Assessing Response Readiness to Health Emergencies: A Spatial Evaluation of Health and Socio-Economic Justice in Pakistan. *Social Indicators Research*, 1-31.
- **Sajjad, M.***, Munir, H., Kanwal, S., & Naqvi, S. A. A. (2022). Spatial inequalities in education status and its determinants in Pakistan: A district-level modelling in the context of sustainable development Goal-4. *Applied Geography*, 140, 102665.
- **Waleed, M., Sajjad M.***, (2022). Leveraging cloud-based computing and spatial modeling approaches for land surface temperature disparities in response to land cover change: Evidence from Pakistan. *Remote Sensing Applications: Society and Environment*, 25, 100665.

- **Sajjad, M.***, Chan, J. C., & Chopra, S. S. (2021). Rethinking disaster resilience in high-density cities: Towards an urban resilience knowledge system. *Sustainable Cities and Society*, 69, 102850. (*Selected as the only Innovative Digital-based Solutions from Hong Kong by the UN-HABITAT to improve quality of life in cities*)
- Ali, G., **Sajjad, M.***, Kanwal, S., Xiao, T., Khalid, S., Shoaib, F., & Gul, H. N. (2021). Spatial-temporal characterization of rainfall in Pakistan during the past half-century (1961–2020). *Scientific Reports*, 11(1), 1-15. (*2021 Top-100 Downloaded Papers (top 15%) in Earth Science — Award by Nature Portfolio*)
- **Sajjad, M.*** (2021). Disaster resilience in Pakistan: A comprehensive multi-dimensional spatial profiling. *Applied Geography*, 126, 102367.
- Raza SH., Haq W., and **Sajjad M.** (2020). COVID-19: A Psychosocial Perspective. *Frontiers in Psychology*, 11, 554624.
- **Sajjad, M.***, & Chan, J. C. (2020). Tropical cyclone impacts on cities: A case of Hong Kong. *Frontiers in Built Environment*, 6, 172. (*Invited Paper*)
- **Kanwal, S., Sajjad, M.**, Gabriel, H. F., & Hussain, E. (2020). Towards sustainable wastewater management: A spatial multi-criteria framework to site the Land-FILTER system in a complex urban environment. *Journal of Cleaner Production*, 266, 121987.
- **Sajjad, M.***, Chan, J. C., & Lin, N. (2020). Incorporating natural habitats into coastal risk assessment frameworks. *Environmental Science & Policy*, 106, 99-110.
- **Sajjad, M.***, Chan, J. C., & Kanwal, S. (2020). Integrating spatial statistics tools for coastal risk management: A case-study of typhoon risk in mainland China. *Ocean & Coastal Management*, 184, 105018.
- **Sajjad, M.***, Lin, N., & Chan, J. C. (2020). Spatial heterogeneities of current and future hurricane flood risk along the US Atlantic and Gulf coasts. *Science of the Total Environment*, 136704.
- Kanwal, S., Ding, X., **Sajjad, M.**, & Abbas, S. (2020). Three decades of coastal changes in Sindh, Pakistan (1989–2018): A geospatial assessment. *Remote Sensing*, 12(1), 8.
- Raza, S. H., Haq, W., & **Sajjad, M.** (2020). COVID-19: a psychosocial perspective. *Frontiers in Psychology*, 11, 554624.
- Ali, G., Abbas, S., Pan, Y., Chen, Z., Hussain, J., **Sajjad, M.***, & Ashraf, A. (2019). Urban environment dynamics and low carbon society: Multi-criteria decision analysis modeling for policy makers. *Sustainable Cities and Society*, 51, 101763.
- **Sajjad, M.***, & Chan, J. C. (2019). Risk assessment for the sustainability of coastal communities: A preliminary study. *Science of The Total Environment*, 671, 339-350.
- **Sajjad, M.**, Li, Y., Li, Y., Chan, J. C., & Khalid, S. (2019). Integrating typhoon destructive potential and social-ecological systems toward resilient coastal communities. *Earth's Future*, 7(7), 805-818.
- **Sajjad, M.**, Li, Y., Tang, Z., Cao, L., & Liu, X. (2018). Assessing hazard vulnerability, habitat conservation, and restoration for the enhancement of mainland China's coastal resilience. *Earth's Future*, 6(3), 326-338.
- Khalid, S., Shoaib, F., Qian, T., Rui, Y., Bari, A. I., **Sajjad, M.**, ... & Wang, J. (2018). Network constrained spatio-temporal hotspot mapping of crimes in Faisalabad. *Applied Spatial Analysis and Policy*, 11, 599-622.

SELECTED CONFERENCES/WORKSHOPS/TALKS

- Keynote Speech (Invited) “Envisioning a Resilient Pakistan: Gender, Intersectionality, and Disaster Risk Reduction” – *Gender, Intersectionality and Climate Change Conference 2024 Sep 24-25. National University of Sciences and Technology and The Deutsche Gesellschaft für Internationale Zusammenarbeit, Germany*
- Invited Talk on “Envisioning Risk-Resilience-Sustainability Nexus under Climatic & Environmental Changes” – *International Workshop on Intelligent Tropical-storm-resilient System for Coastal Cities 2024 Aug 25, The Hong Kong Polytechnic University, HK-SAR*
- Talk on “Risk-Resilience-Sustainability Nexus in a changing world” – *the Smart Society Lab Research Dialogue Workshop 2023, May 10, 2023. Hong Kong Baptist University, HK-SAR*
- Oral Presentation on “Towards hazard, vulnerability, and resilience-based assessment of spatial-temporal trends, patterns, and disparities in drought risk” – *EGU 2023, April 23-28, 2023. Vienna, Austria*
- Invited Seminar Talk on “Building Resilient Coastal Communities” – *ESSC-CUHK, August 2021*
- Invited talk on International Industrial Ecology Day – *ISIE, June 2021*
- Engineering Mechanics Institute Conference 2019 – *California Institute of Technology, USA*
- Princeton Research Day 2019 – *Princeton University, USA (Session Chair)*

- *Workshop on Disasters and Societies 2019 – University of Geneva, Switzerland*
- *International Workshop on Urbanization in Watersheds 2016 – The Institute of Urban Environment, Chinese Academy of Sciences, Xiamen, China*
- *International Workshop on Earth Observation and Remote Sensing Applications 2017 – IEEE Sponsored*
- *Forum of New Path of Urbanization and Ecological Civilization 2016 – Xiamen University, China (Best Paper Award)*

ACADEMIC COMMUNITY SERVICE

Review Editor (JCR Listed Journals):

- *Frontiers in Environmental Science*

Verified Peer Reviewer:

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| <ul style="list-style-type: none"> • <i>Sustainable Cities and Society</i> • <i>Science of the Total Environment</i> • <i>Environment International</i> • <i>Environmental Science & Technology</i> • <i>Building and Environment</i> • <i>Scientific Reports (Nature Portfolio)</i> • <i>Renewable and Sustainable Energy Reviews</i> | <ul style="list-style-type: none"> • <i>Journal of Environmental Management</i> • <i>Progress in Physical Geography</i> • <i>International Journal of Disaster Risk Reduction</i> • <i>Geo-Spatial Information Science</i> • <i>Natural Hazards</i> • <i>International Journal of Disaster Risk Reduction</i> • <i>Natural Hazards and Earth System Sciences</i> |
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REFERENCES & WORK SAMPLES

Provided if requested.