# CURRICULUM VITAE


**Dr. Balqis Mohamed Rehan**

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**ResearchGate** : Balqis Mohamed Rehan
**Website** : -


## Education

- D.Phil. in Geography and the Environment, 2016, University of Oxford, U.K.
  Title: Risk-based flood protection decisions in the context of climatic variability and change.
- M.Eng. (Hons) Environmental Engineering, 2009, Universiti Kebangsaan Malaysia (UKM), Malaysia.
- B.Eng. (Hons) Civil Engineering, 2007, Universiti Teknologi Malaysia (UTM), Malaysia

## Research Interest

- Flood risk assessment and management
- Statistical hydrology
- Water Resources

## Professional Membership & Learned Society

- Member, International Association of Hydrological Sciences (IAHS)
- Member, Board of Engineers Malaysia (BEM)
- Member, European Geosciences Union (EGU)

## Appointments

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| • Senior lecturer, Department of Civil Engineering, Faculty of Engineering, UPM | 11 August 2016 – on going |
| • Coordinator for Department of Civil Engineering Student's Welfare, Faculty of Engineering, UPM | 2022 - on-going |
| • Coordinator for Master by research, Water Unit, Department of Civil Engineering, Faculty of Engineering, UPM. | 2017 – 2021 |
| • Tutor, Department of Civil Engineering, Faculty of Engineering, UPM Development Coordinator of Civil Engineering Department,UPM | Nov 2007 - 12 August 2016 |

## Publications

1. Mohd Ghamrawi, M. F., Rehan, B. M., Kabirzad, S. A., Yusuf, B., Zulkafli, Z., Bakti, H.-B., & Toriman, M. E. (2025). Evaluating the performance of depth-damage curves in flood damage and risk analysis: A case study from Malaysia. Jurnal Kejuruteraan (Journal of Engineering), 37(5), 2159–2172. https://doi.org/10.17576/jkukm-2025-37(5)-11
2. Mohd Yodin, N. A., Rehan, B. M., & Yusoff, B. (in press). To what extent can nature-based solutions on an institutional complex reduce pluvial flood risk? International Journal of Sustainable Tropical Design Research and Practice.
3. Kabirzad, S. A., Rehan, B. M., Zulkafli, Z. D., Yusuf, B., Hasan-Basri, B., Toriman, M. E., & Penning-Rowsell, E. C. (2025). An assessment of multiple variables predicting the psychological effects of flooding: Case study in Peninsular Malaysia [Preprint]. EGUsphere. https://doi.org/10.5194/egusphere-2025-2917
4. Sivapiragasam, R. R., **Rehan, B. M**., Yodin, N. A. M., Razak, M. S. A., & Yusuf, B. (2025). Decision analysis on mobile flood wall barrier implementation for a government school using cost-benefit analysis. *Journal of Water Resources Management*, *3*(1).
5. Zakari, M. D., Kamal, M. R., Ramli, N. M., **Rehan, B. M.,** & Mohd, M. S. F. B. (2025). Trends in Rainfall-Temperature Projections in Upper Bernam River Basin Using CMIP6 Scenarios in Malaysia. Revue Internationale de Géomatique, 34(487), 487–511. https://doi.org/10.32604/rig.2025.065835
6. Liu, Y., Yusof, M. J. M., **Rehan, B. M.,** & Kasim, J. A. (2024). Assessment of the Spatio-Temporal Dynamics in Urban Green Space via Intensity Analysis and Landscape Pattern Indices: A Case Study of Taiyuan, China. Sustainability (Switzerland), 16(19), 8363.
7. **Rehan, B. M.,** Bweya, A. Z., Mok, Y. W., Zulkafli, Z., & Raffar, N. (2024). Seasonal flood risk for paddy rice production in northwest Peninsular Malaysia. *Hydrological Sciences Journal*, 69(4), 506-518.
8. **Rehan, B. M.,** Hall, J. W., Penning-Rowsell, E. C., & Tan, V. Z. H. (2024). A comparison of the cost effectiveness of property-level adaptation and community-scale flood defences in reducing flood risk. *Journal of Flood Risk Management,* 17(1), e12956.
9. Kabirzad, S. A., **Rehan, B. M.**, Zulkafli, Z., Hasan-Basri, B., & Toriman, M. E. (2024). Examining direct and indirect flood damages in residential and business sectors through an empirical lens. Water Science and Technology, 90(1), 142–155.
10. Mohamad, S., Ash'aari, Z. H., Ramli, M. F., Abdullah, R., & **Rehan, B. M.** (2023). Application of a hybrid cellular automaton-markov model in land use change detection and prediction in flood-prone area, Johor, Malaysia. Planning Malaysia, 21(6), 170–184.
11. Radzali, N. A. W. M., Shafri, H. Z. M., Yusuf, B., & **Rehan, B. M.** (2023). Suitability model development for rooftop rainwater harvesting (RRWH) system in an urban area using geographical information systems. Songklanakarin Journal of Science and Technology, 45(2), 294–300.
12. Fatdillah, E., **Rehan, B. M.,** Rameshwaran, P., Bell, V. A., Zulkafli, Z., Yusuf, B., & Sayers, P. (2022). Spatial estimates of flood damage and risk are influenced by the underpinning DEM resolution: A case study in Kuala Lumpur, Malaysia. *Water,* 14(14), 2208.
13. Raffar, N., Zulkafli, Z., Yiwen, M., Muharam, F. M., **Rehan, B. M.,** & Nurulhuda, K. (2022). Watershed-scale modelling of the irrigated rice farming system at Muda, Malaysia, using the Soil Water Assessment Tool. *Hydrological Sciences Journal,* 67(3), 462-476.
14. Abdi, M. J., Raffar, N., Zulkafli, Z., Nurulhuda, K., **Rehan, B. M.,** Muharam, F. M., ... & Tangang, F. (2022). Index-based insurance and hydroclimatic risk management in agriculture: A systematic review of index selection and yield-index modelling methods. *International Journal of Disaster Risk Reduction,* 67, 102653.

15. Houma, A. A., Kamal, M. R., Mojid, M. A., Zawawi, M. A. M., & **Rehan, B. M.** (2021). Predicting climate change impact on water productivity of irrigated rice in malaysia using fao-aquacrop model. *Applied Sciences,* 11(23), 11253.
16. Zulkafli, Z., Muharam, F. M., Raffar, N., Jajarmizadeh, A., Abdi, M. J., **Rehan, B. M.,** & Nurulhuda, K. (2021). Contrasting Influences of Seasonal and Intra-Seasonal Hydroclimatic Variabilities on the Irrigated Rice Paddies of Northern Peninsular Malaysia for Weather Index Insurance Design. *Sustainability,* 13(9), 5207.
17. Ali, H. L., Yusuf, B., Mohammed, T. A., Shimizu, Y., Ab Razak, M. S., & **Rehan, B. M.** (2019). Enhancing the flow characteristics in a branching channel based on a two-dimensional depth-averaged flow model. *Water,* 11(9), 1863.
18. Ali, H. L., Yusuf, B., Mohammed, T. A., Shimizu, Y., Ab Razak, M. S., & **Rehan, B. M.** (2019). Improving the hydro-morpho dynamics of a river confluence by using vanes. *Resources,* 8(1), 9.
19. Ali, H.L., Yusuf, B., Mohammed, T.A., Shimizu, Y., Ab Razak, M.S., **Rehan, B.M.,** 2019. Assessment of vanes effectiveness in controlling erosion and deposition zones at a river confluence using a 2D model. *International Journal of Integrated Engineering,* 11(2), 223-235. https://doi.org/10.30880/ijie.2019.11.02.024
20. **Rehan, B.M.,** 2018. An innovative micro-scale approach for vulnerability and flood risk assessment with the application to property-level protection adoptions. Natural Hazards, 91 (3), 1039-1057. https://doi.org/10.1007/s11069-018-3175-5
21. **Rehan, B.M**., 2018. Accounting public and individual flood protection measures in damage assessment: A novel approach for quantitative assessment of vulnerability and flood risk associated with local engineering adaptation options. Journal of Hydrology, 563, 863–873. https://doi.org/10.1016/j.jhydrol.2018.06.061

## Conference

1. **Rehan, B. M.,** Hadawiyah, T. "Risk-Based Flood Analysis Considering Spatially Heterogeneous Economic Vulnerability for Targeted Measures in a Rural River Basin.' Water Security and Climate Change Conference. GieBen, Germany. 8 – 10 October 2025.
2. Yiwen, M., Zulkafli, Z., **Rehan, B. M.**, Juneng, L., & Amirudin, A. A. Evaluation of Nature-Based Solution to Climate Change Impact on Watershed Hydrology. 4th World Irrigation Forum. 2024
3. Mohd Alayudin, A. U., & **Rehan, B. M.,** Implication of Uncertainty in River Gauged Data and the Rating Curve Representations to Flood Quantiles: Case Studies from Stations Across Peninsular Malaysia. In Lecture Notes in Civil Engineering (Vol. 386, pp. 665–682). 2024
4. **Rehan, B. M.,** Shamsuddin, N. N. Preference over nonstationary on design storms in Sungai Kinta River basin, Malaysia, and its effects to design flows. Water Security and Climate Change Conference. GieBen, Germany. 9 – 11 October 2024.
5. **Rehan, B. M.,** Kabirzad, S. A. Economic flood damage analysis on residential buildings in Peninsular Malaysia through empirical data. 11th Malaysia Statistics Conference 2024, Sasana Kijang, Bank Negara. 19 September 2024.
6. **Rehan, B. M.,** & Yiwen, M. (2023). Discrepancies in estimated flood losses on paddy production: Application of damage models on historical flood records of the Northwest States of Peninsular Malaysia. In *IOP Conference Series: Earth and Environmental Science* (Vol. 1205, No. 1, p. 012020). IOP Publishing.

7. Bell, V., **Rehan, B.,** H. Basri, B., Houghton-Carr, H., Miller, J., Reynard, N., Sayers, P., Stewart, E., Toriman, M.E., Yusuf, B., Zulkafli, Z., Carr, S., Chapman, R., Davies, H., Fatdillah, Eva., Horritt, M., Kabirzad, S., Kaelin, A., Tochukwu, O., Ponnambalam, R., and Simpson, M. Flood Impacts across Scales: towards an integrated multi-scale approach for Malaysia, FLOODrisk 2020 – 4th European Conference on Flood Risk Management. Online. 21-25 June 2021.
8. **Rehan, B.M.,** M. Ghamrawi, M.F. Uncertainty in estimated flood losses from national and global derived depth-damage functions: A case study in Malaysia, Water Security and Climate Change Conference (WSCC), online, 1-4 March 2021.
9. **M. Rehan, B.,** Sayers, P., M. Alayuddin, A. U., M. Ghamrawi, M. F., D. Miller, J., A. Kabirzad, S., Kaelin, A., C. Penning-Rowsell, E., H. Basri, B., A. Bell, V., Zulkafli, Z., and J. Stewart, E. Flood vulnerability assessment: A critical comparison between site derived, national and international depth-damage functions and their use in assessing flood risk in Malaysia, EGU General Assembly 2021. online. 19–30 April 2021.
10. **Rehan, B. M.,** Yusuf, A. M., & Idham, I. L. (2020). Flood risk estimation of paddy production considering plants' age and flood durations. In *Proceedings of AICCE'19: Transforming the Nation for a Sustainable Tomorrow 4* (pp. 1163-1174). Springer International Publishing.
11. **Rehan, B. M.,** Yodin, A.M. Using Green Infrastructure to Mitigate Flood Impact: A Review in The Context of Malaysia. The 6th Putrajaya International Built Environment, Technology and Engineering Conference. Bangi Resort Hotel, Malaysia. 15 – 16 April 2019.
12. **Rehan, B. M.,** Robustness of Risk-Based Optimization Methodology for Flood Protection Decisions. 37th IAHR World Congress. Kuala Lumpur, Malaysia. 13 – 18 August 2017.
13. **Rehan, B.** and Hall, J.W. (2016) Uncertainty and sensitivity analysis of flood risk management decisions based on stationary and nonstationary model choices. E3S Web of Conferences 7, 20003. 2016.
14. **Rehan, B.** and Hall, J.W. (2014): Flood risk management decision analysis with finite historical records and highly variable climate effects, Proceedings of the Second International Conference on Vulnerability and Risk Analysis and Management (ICVRAM2014), University of Liverpool, UK. American Society of Civil Engineers (ASCE). pp. 2867-2879. doi: 10.1061/9780784413609.289. 13 - 16 July 2014.
15. **Rehan, B.** and Hall, J.W. Exploring the limits of stationarity in flood frequency analysis and optimal investment decisions, European Symposium on Flood Frequency Estimation and Implications for Risk Management, Potsdam, Germany, 6 - 7 March 2014
16. **Rehan, B.** and Hall, J.W. Risk-based appraisal of flood mitigation strategies under variable climate, Tyndall Centre's Third Annual PhD Conference, Cardiff, 3 - 5 April 2013.

## Book Chapters

1. Ulwan, A., **Rehan, B.M.** Assessment of river gauging data to account for uncertainty in flood quantile estimation: Case studies of Peninsular Malaysia. Proceedings of AWAM International Conference on Civil Engineering 2022 - Volume 3 eBook ISBN 978-981-99-6026-2.
2. **Rehan, B. M.,** Zakaria, F., 2021. Micro-scale flood damage and risk assessments: A case study in Kelantan, Malaysia. Community, Environment and Disaster Risk Management, 23, 13-23. https://doi.org/10.1108/S2040-726220210000023008

## Research Grants

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|---|---|---|---|
| ● Enhancing urban flood regulating ecosystem services in Malaysia via nature-based solutions **(Co-researcher)** | Inisiatif Putra Siswazah (Universiti Putra Malaysia) | 2024-2027 | RM 20,000 |
| ● Nature-based solutions to mitigate flood risk under climate change In Northern Malaysia | Inisiatif Putra Siswazah (Universiti Putra Malaysia) | 2023 - 2026 | RM20,000 |
| ● Assessing the economic impact of water security and building resilience program for local adaptive capacity for water-related disasters in Southeast Asia (**Co-researcher**) | Economy and Environment Partnership for Southeast Asia (EEPSEA) | 2022- 2023 | RM 61,000 |
| ● Development of a flood loss model and a flood risk assessment framework for paddy **(Leader)** | FRGS (Ministry of Higher Education, Malaysia) | 2019-2023 | RM61,000 |
| ● Climate-smart DSS (CSDSS): A New Robust Downscaling Approach for Use in Climate Smart Agriculture (CSA) Practices and Climate Change Studies **(Co-researcher)** | FRGS (Ministry of Higher Education, Malaysia) | 2019-2022 | RM92,600 |
| ● Flood Impacts across Scales- informing models of flood exposure and vulnerability via an integrated multi-scale approach. **(Leader)** | NEWTON Fund. Natural Environment Research Council (NERC) UK and Ministry of Education, Malaysia | 2019 - 2022 | RM140,000 |
| ● Flood risk assessment for a vulnerable riverine residential area in the northeast states of Peninsular **Malaysia (Leader)** | Inisiatif Putra Muda (UPM) | 2017-2019 | RM60,000 |
| ● Quantifying threats to food (rice) security in Malaysia under climate change and mitigation using a weather-based risk approach **(Co-researcher)** | FRGS (Ministry of Higher Education, Malaysia) | 2017-2020 | RM76,800 |

## Student's supervision

**MSc coursework research students (supervisor)**

| | | |
|---|---|---|
| 1. Fitrawati Zakaria | GS46624 | Graduated 2019 |
| 2. Mohamed Muhumed Yousuf | GS53450 | Graduated 2020 |
| 3. Mohamed Haibe Madar | GS51593 | Graduated 2020 |
| 4. AbdiRazak Abdoukarim Moussa | GS58030 | Graduated 2021 |
| 5. Ali Mohammed Ali Al-Nadish | GS59482 | Graduated 2022 |

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| 6. Norashikin Abdullah | GS60009 | Graduated 2022 |
| 7. Siti Afiqah Aminah Mohd Noor | GS65696 | Graduated 2023 |
| 8. Nurul Naqila Shamsuddin | GS61438 | Graduated 2023 |
| 9. Teow Xianhu | GS63893 | Graduated 2024 |
| 10. Sun Han | GS69390 | Graduated 2025 |
| | GS71082 | |
| 11. Wan Nurulain Binti Wan Mohamed Azhary | | Graduated 2026 |

**MSc research students (main supervisor)**

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| | GS58497 | |
| 12. Ammar Ulwan bin Mohd Alayudin | GS58795 | On-going |
| 13. Muhammad Fadhil bin Mohd Ghamrawi | GS56464 | Graduated |
| 14. Nisa Eva Lailatun | GS52327 | Graduated |
| 15. Nurul Azura Mohd Yodin | | Graduated |

**Doctor of Philosophy (main supervisor)**

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| | GS74985 | |
| 16. Muhammad Rezaul Rakib | GS68287 | On-going |
| 17. Ng Yu En | GS69195 | On-going |
| 18. Ding Cong | GS56560 | On-going |
| 19. Kabirzad Shabir Ahmad | | Awaiting senate approval |

## Industry Projects/Consultancy

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| 1. Preparation of flood hydrodynamic modelling, flood damage assessment and flood risk guideline for Nexus EC Sdn. Bhd. and JPS Malaysia (**Subject matter expert)**. | 2024-2025 | RM20,000 |
| 2. Integrated River Basin Management for Sg. Rompin and Sg. Pontian for Nexus EC Sdn. Bhd. and JPS Malaysia (**Subject matter expert**). | 2023-2025 | RM40,000 |
| 3. Kajian Mekanisme Pembiayaan Alternatif Infrastruktur Sumber Air di Malaysia. Pakar Pengurusan Risiko Banjir for Kementerian Peralihan Tenaga Dan Transformasi Air (PETRA) (**Subject matter expert).** | 2024-2025 | RM20,000 |
| 4. Proposed Development of Sustainable Facility and Eco-Park Centre (SAFE-T) at Teluk Kalong, Kemaman, Terengganu for Alam Flora Environmental Solutions Sdn. Bhd. Nexus EC Sdn. Bhd. and JPS Malaysia (**Subject matter expert**) | 2024 | RM14,370 |
| 5. Effectiveness of Mobile Flood Barrier for Humid Tropics Centre, JPS Malaysia. (**Leader**). | 2022-2023 | RM118,000 |

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| 6. | Perunding Bagi Memberi Maklum Balas Berkenaan Cadangan Pengambilan Tanah Hakmilik UPM Bagi Perancangan Tebatan Banjir for UPM (**Subject matter expert)** | 2022 | - |
| 7. | Sg. Pinang Catchment Flood Mitigation Project for JPS Malaysia. (**Subject matter expert)**. | 2018-2019 | RM21,120 |

## Community projects/outreach

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| 1. | Director of student's inbound mobility (KMUTT – UPM) in Faculty of Engineering, UPM (**Director)** | 2024 | RM20,100 |
| 2. | Student's outbound mobility at King Mongkut's University of Technology Thonbury (KMUTT), Thailand (**Director**). | 2023 | RM35,620 |
| 3. | Director of student's outbound community service at Safetist Farm, Thonbury (KMUTT), Thailand (**Director)** | 2023 | RM2,650 |
| 4. | STEM activity on "flood measures" for school holiday programme at Surau Al-Amin Alam Sari, Kajang. (**Committee member**) | 2023 | - |
| 5. | Water, sanitation, and hygiene (WASH) project using IBS system at two schools in Selangor (PutraWASH2022) with SMK Seri Garing and SK Sungai Choh (**Committee Member**) | 2022 | RM7,296 |
| 6. | STEM activity on "hydraulic arm" for school holiday programme at Sekolah Sri Al-Amin Bangi. (**Director and committee member**) | 2019, 2020 | - |
| 7. | Innovative Designs of Sustainable Agro-Hydro-Health Systems Workshop at Orang Asli Belum Forest (**Committee member**) | 2017 | - |
| 8. | Program Gemerlap Remaja Siber (ProGresif 2011) with UKM and school children (**Deputy program director**) | 2011 | - |

## Professional Services (Journal Reviewer, task force, workshop and training.)

**Journal reviewer**

- International Journal of Disaster Risk Reduction — On-going
- Frontiers Sustainable Cities
- Geomatics, Natural Hazards and Risk
- Scientific Reports
- Environmental Monitoring and Assessment
- Theoretical and Applied Climatology

**Task Force/Expert panel** — 2024

- Task force for Semakan Kurikulum Program Master Kejuruteraan Air, Fakulti Kejuruteraan, Universiti Putra Malaysia — 2022
- Expert panel for Townhall Session on MBSA Masterplan for Shah Alam, Sustainable Urban Drainage Master Plan (SASUD)

**Evaluation panel**

- Pertandingan Anugerah Tesis Terbaik Peringkat Kebangsaan Bagi Siswazah Sarjana Muda, Sarjana Dan Doktor Falsafah (Phd) Sempena Sambutan Hari Air Sedunia (HAS) Peringkat Kebangsaan, Humid Tropic Centre, JPS Malaysia — 2024, 2025
- Penilai bagi Anugerah Aspirasi Fakulti Kejuruteraan, Universiti Putra Malaysia 2024 — 2024

**Workshop/Training/Seminar**

- Focus Group Discussion on alternative financing mechanisms of water infrastructure, gathering stakeholders from the Government and Private companies, Hotel Pulse Grande, Putrajaya. 15 April 2025 (**Committee member**) — 2025
- Introduction to Modeling River Flow and Morphodynamics within the IRIC 4.0 Interface. Faculty of Engineering, UPM. 17 – 18 April 2024 (**Committee member**) — 2024
- Focus Group Discussion on alternative financing mechanisms of water infrastructure, gathering stakeholders from the Government agencies, in collaboration with PETRA. Hotel Zenith, Putrajaya.19 September 2024 (**Committee member**) — 2024
- Talk on 'Future Flood Risk in Peninsular Malaysia' at Universiti Putra Malaysia. Program in collaboration with UK CEH and IEM. Faculty of Engineering, UPM and online. 19 September 2023 (**Speaker and committee member**) — 2023
- Latihan penggunaan Dashboard bagi penilaian kos-faedah bagi Mobile Floodwall Barrier (MFWB), Humid Tropics Centre, JPS Malaysia. 17 Ogos 2023 (**Trainer**) — 2023
- Malaysia Air Quality Annual Seminar (MAQAS 2017), Hotel Bangi-Putrajaya. 12 July 2017 (**Committee member)** — 2017
- Global Civil Engineering, Faculty of Engineering, UPM. World Trade Center, Kuala Lumpur. 25 – 28 July 2017 (**Committee member)** — 2017

## Awards and Recognition

1. Silver medal. The 7th International Putra Innocreative Carnival in Teaching and Learning (I-PICTL2025) and SULAM@UPM Carnival 2025). "Enhancing River Engineering Education Through Experiential and case study-based learning". — 2025
2. Gold medal. 11th Malaysia Road Conference and Invention & Innovation Exhibition (MRC-IIE), "Risk-based decision making for road infrastructure design and planning (Flood R2R)". 5 – 7 November 2024. WTC, Kuala Lumpur — 2024
3. Travel and conference grant award (RM8,280), Water Security and Climate Change Conference (WSCC), 9 – 11 October 2024. Germany — 2024

4. Gold medal. Putra InnoCreative Poster Competition, International Putra InnoCreaticve Carnival in Teaching and Learning 2023 (I-PicTL). “Enhancing Engineering Education Through Community Service Integration”. 2023
5. Gold medal. Anugerah tesis (kategori pra-siswazah – pelajar dibawah seliaan) sempena Anugerah Tesis Terbaik Sempena Hari Air Sedunia Peringkat Kebangsaan, 2023. 2023
6. Travel and conference grant award (500 Pound Sterling), Environmental Change Institute (ECI), University of Oxford 2014

## Teaching Experience

- Surface hydrology (Master course)
- Fluvial flood risk assessment (Master course)
- Engineering hydrology (Undergraduate course)
- Hydraulics I (Undergraduate course)
- Hydraulics II (Undergraduate course)
- River Engineering (Undergraduate course)