Dr. Raihan Ahmed

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Citations: **1320**
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Reads on Research Gate:**91,163**
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Research Interest

Remote Sensing and GIS Applications in Agriculture, Natural Resource Management and Earth Surface Processes

Academic Achievements

University Grants Commission National Eligibility Test (Geography) for Assistant Professor qualified in 2014

Ph.D. Awarded in 22nd June 2018

Topic: Integrated Watershed Management for Sustainable Development of Natural Resources: A case study of Lower Barpani River, Assam

Published Research Work: 47

- SCI and Scopus Indexed: **38**
- Others: **09**

Paper presented at Conferences: 09

- International:**04**
- National:**05**

Teaching Experience: 08 Years **Research Experience: 10 Years**

Papers taught

- Digital Mapping-II (PGDDC, Theory)
- Watershed Management (MA/MSc, Theory)
- Climatology and Oceanography (MA/MSc, Theory)
- Geographical Information System (PGDRS, MA/MSc, Practical)
- Applications of Remote Sensing and GIS (PGDRS, Theory and Practical)

Professional Training Programme Participated: 03

Reviewer: 04 Journals

Journal of Maps (***Taylor and Francis***); Remote Sensing Applications: Society and Environment (***Elsevier***); Journal of Geographical Studies (***Gatha Cognition***); Geo-spatial data in Natural Resources (***Gatha Cognition)***.

Academic Qualifications

Course	Subjects	Board/ University	Year	Division/Class
Ph.D.	Geography (Watershed Management)	Jamia Millia Islamia	22nd June 2018	Awarded
P.G. Diploma in Remote Sensing & GIS	Remote Sensing, GIS	Jamia Millia Islamia	2014	1st Class Distinction
M. A.	Geography	Jamia Millia Islamia	2013	1st Class
B. A.	Geography	Gauhati University	2011	1st Class
H. S. (12th)	Eng, Ass, Geo, Eco, Pol. Sc.	Assam Higher Secondary Education Council	2008	1st Division
H.S.L.C. (10th)	Eng, Ass, G. Sc, S. Sc, Math, Geo.	Board of Secondary Education, Assam	2006	1st Division

Technical Skills

1. Digital Image Processing
2. Photogrammetry
3. Geographical Information System
4. Global Positioning System

Research Experience

10 Years of research experience in various fields:

Climate and Environment: Climate Change, Climate Variability, Climate Change impact assessment, Livelihood vulnerability assessment due to climate change

Agriculture: Crop Combination; Yield Estimation, Crop Acreage, Crop Biomass, Soil Moisture, RUSLE, Thematic Mapping.

Forest: Forest Fragmentation, Canopy Density, Forest Biomass, Forest health, Wildlife Habitat Suitability,

Hazards and Disasters: Flood, Landslide, Vulnerability Assessment, Risk Assessment.

Teaching Experience

Guest Faculty in the Department of Geography, JMI from 2016 to 2018

Assistant Professor (Contractual) in the Department of Geography, JMI from2018 to 2020

Assistant Professor in the Department of Geography, Nowgong College (Autonomous) since 2021

Invited Talks/ Lecture/ Seminar and Workshop

- Invited lecture on "**Understanding Climate Change and Green House Gases**" organized by Kampur College on 08th June, 2022
- Invited as resource person in Tezpur Univesity for 5 day training programme on "**Climate Impact Modelling Techniques**" organized by Centre for Excellence, Department of Environmental Science, Tezpur University from 19th to 23rd December, 2022
- Invited speaker for **World Water Day** observation in Motiram Borah H.S. School, Nagaon on 22nd March, 2023
- Invited speaker for **International Biodiversity Day** observation in Nowgong College (Autonomous) on 22nd May, 2024

Life Member of Professonal bodies

- UNESCO Association Assam Chapter
- Assam Science Society
- North East India Geographical Society

Professional Training program Participated

1. Participated in the DST Funded3-week training program on "**Geospatial Technologies**" organized by the Department of Geography, Jamia Millia Islamia, New Delhi. 2017
2. Participated in the training program on **"Rooftop Solar Web GIS Tool for Indian Solar Cities"** held at the TERI University, New Delhi. 2014
3. Participated in the training course in **"Remote Sensing and Geographic Information System"** conducted at Regional Remote Sensing Centre-East, NRSC, ISRO, Kolkata. 2013

Ph.D. Scholars under Supervision

1. **Mr. Sidhartha Pator:** "Spatial Analysis of Land Suitability for Crop Diversification in Morigaon District, Assam" **On-going**

2. **Mr. Nabajyoti Nath:** "Fragmentation induced alteration of Forest Cover Analysis using Geospatial Technology in Laokhowa and Burachapori Wildlife Sanctuary" **On-going**

Research Paper Publication

1. Bhuyan, N., Sajjad, H., Sharma, Y., Sharma, A., & **Ahmed, R.** (2024). Assessing socio-economic vulnerability to riverbank erosion in the Middle Brahmaputra floodplains of Assam, India. *Environmental Development*, 101027.

2. Sharma, Y., **Ahmed, R.,** Saha, T. K., Bhuyan, N., Kumari, G., Pal, S., & Sajjad, H. (2024). Assessment of groundwater potential and determination of influencing factors using remote sensing and machine learning algorithms: A study of Nainital district of Uttarakhand state, India. *Groundwater for Sustainable Development*, *25*, 101094.

3. Sharma, Y., Sajjad, H., Saha, T. K., Bhuyan, N., Sharma, A., & **Ahmed, R.** (2024). Analyzing and forecasting climate variability in Nainital district, India using non-parametric methods and ensemble machine learning algorithms. *Theoretical and Applied Climatology*, 1-17.

4. Bhuyan, N., Sajjad, H., Rahaman, M. H., & **Ahmed, R.** (2024). Vulnerability to riverbank erosion in India and Bangladesh: A review for future research framework. *Authorea Preprints*.

5. Bhuyan, N., Sajjad, H., Saha, T. K., Sharma, Y., Masroor, M., Rahaman, M. H., & **Ahmed, R.** (2024). Assessing landscape ecological vulnerability to riverbank erosion in the Middle Brahmaputra floodplains of Assam, India using machine learning algorithms. *Catena*, *234*, 107581.

6. Rehman, S., Rahaman, M. H., Masroor, M., Roshani, Sajjad, H., **Ahmed, R.,** ... & Sahana, M. (2023). Analyzing vulnerability of communities to flood using composite vulnerability index: evidence from Bhagirathi Sub-basin, India. *Natural Hazards*, *119*(3), 1341-1377.

7. Bhuyan, N., Sharma, Y., Sajjad, H., & **Ahmed, R.** (2023). Estimating bank-line migration of the Brahmaputra River in the Middle Brahmaputra floodplains of Assam, India using digital shoreline analysis system. *Environmental Earth Sciences*, *82*(16), 385.

8. Kumari, G., Sajjad, H., Rahaman, M. H., Masroor, M., **Ahmed, R.,** & Sahana, M. (2022) Climate variability induced livelihood vulnerability: A Systematic Review and Future Prospects. ***Area***. *https://doi.org/10.1111/area.12822*

9. Roshini., Sajjad, H., Rahaman, M. H., Rehman, S., Masroor, M., & **Ahmed, R**. (2022). Assessing forest health using remote sensing-based indicators and fuzzy analytic hierarchy process in Valmiki Tiger Reserve, India. ***International Journal of Environmental Science and Technology***, 1-20.

10. Rahaman, M. H., Masroor, M., Rehman, S., Singh, R., **Ahmed, R**., Sahana, M., &Sajjad, H. (2022). State of Art of Review on Climate Variability and Water Resources: Bridging Knowledge Gaps and the Way Forward. ***Water Resources***, *49*(4), 699-710.

11. Roshini.,Sajjad, H., Kumar, P., Masroor, M., Rahaman, M. H., Rehman, S., **Ahmed, R**., &Sahana, M. (2022). Forest Vulnerability to Climate Change: A Review for Future Research Framework. ***Forests*****,** *13*(6), 917.

12. Masroor, M., Sajjad, H., Rehman, S., Singh, R., Rahaman, M. H., Sahana, M., **Ahmed, R.**&Avtar, R. (2022). Analysing the relationship between drought and soil erosion using vegetation health index and RUSLE models in Godavari middle sub-basin, India. ***Geoscience Frontiers*****,** *13*(2), 101312.

13. Rehman, S., Sajjad, H., Masroor, M., Rahaman, M. H., **Ahmed, R.,**&Sahana, M. (2022). Assessment of evidence-based climate variability in Bhagirathi sub-basin of India: a geostatistical analysis. ***ActaGeophysica*****,** *70*(1), 445-463.

14. Sharma, Y., **Ahmed, R.,**&Sajjad, H. (2022). Assessing vegetation condition across topography in Nainital district, India using temperature vegetation dryness index model. ***Modeling Earth Systems and Environment***, *8*(2), 2167-2181.

15. Masroor, M., Rehman, S., Sajjad, H., Rahaman, M. H., Sahana, M., **Ahmed, R.,**& Singh, R. (2021). Assessing the impact of drought conditions on groundwater potential in Godavari Middle Sub-Basin, India using analytical hierarchy process and random forest machine learning algorithm. ***Groundwater for sustainable development***, *13*, 100554.

16. Sahana, M., Rehman, S., **Ahmed, R.,**&Sajjad, H. (2021). Assessing losses from multi-hazard coastal events using Poisson regression: empirical evidence from Sundarban Biosphere Reserve (SBR), India. ***Journal of Coastal Conservation*****,** *25*(1), 1-10.

17. Sahana, M.,Rehman, S., Ahmed, R., &Sajjad, H. (2021). Analyzing climate variability and its effects in Sundarban Biosphere Reserve, India: reaffirmation from local communities. ***Environment, Development and Sustainability***, *23*(2), 2465-2492.

18. Masroor, M., Rehman, S., Avtar, R., Sahana, M., **Ahmed, R.,**&Sajjad, H. (2020). Exploring climate variability and its impact on drought occurrence: evidence from Godavari Middle sub-basin, India. ***Weather and climate extremes***, *30*, 100277.

19. Talukdar, N. R., Choudhury, P., Ahmad, F., Al-Razi, H., &**Ahmed, R.** (2020). Mapping and assessing the transboundary elephant corridor in the Patharia Hills Reserve Forest of Assam, India. ***Rangeland Ecology & Management***, *73*(5), 694-702.

20. Mandal, V. P., Rehman, S., **Ahmed, R**., Masroor, M., Kumar, P., & Sajjad, H. (2020). Land suitability assessment for optimal cropping sequences in Katihar district of Bihar, India using GIS and AHP. ***Spatial Information Research***, 1-11.Doi: 10.1007/s41324-020-00315-z

21. Rehman, S., Sahana, M., Kumar, P., **Ahmed, R.,**&Sajjad, H. (2021). Assessing hazards induced vulnerability in coastal districts of India using site-specific indicators: an integrated approach. ***GeoJournal***, *86*(5), 2245-2266.

22. Talukdar, N. R., Choudhury, P., Ahmad, F., Ahmed, R., & Al-Razi, H. (2020). Habitat suitability of the Asiatic elephant in the trans-boundary Patharia Hills Reserve Forest, northeast India. ***Modeling Earth Systems and Environment***, *6*(3), 1951-1961.

23. Talukdar, N. R., **Ahmed, R**., Choudhury, P., &Barbhuiya, N. A. (2019). Assessment of forest health status using a forest fragmentation approach: a study in Patharia Hills Reserve Forest,

northeast India. ***Modeling Earth Systems and Environment***, 1-11. Doi: 10.1007/s40808-019-00652-5

24. Sahana, M., Hong, H., **Ahmed, R.,** Patel, P. P., Bhakat, P., & Sajjad, H. (2019). Assessing coastal island vulnerability in the Sundarban Biosphere Reserve, India, using geospatial technology. ***Environmental Earth Sciences***, *78*(10), 304. Doi: 10.1007/s12665-019-8293-1

25. Mandal, V. P., **Ahmed, R**., Rehman, S., Masroor, M., & Sajjad, H. (2019). Exploring optimal cereal crop sequence using cultivated land utilization index and yield in Katihar district, India: a sub division level analysis. ***Asian Journal of Agriculture and rural Development***, *9*(1), 62-81.Doi: 10.18488/journal.1005/2019.9.1/1005.1.62.81

26. **Ahmed R**, Sajjad H (2018)Analyzing Factors of Groundwater Potential and Its Relation with Population in the Lower Barpani Watershed, Assam, India. ***Natural Resources Research***, **Springer**27(04):503–515.Doi:10.1007/s11053-017-9367-y

27. Kumar P, Sajjad H, Mahanta KK, **Ahmed R**, Mandal VP (2018) Assessing suitability of allometric models for predicting stem volume of Anogeissus pendula Edgew in sariska Tiger Reserve, India. ***Remote Sensing Applications: Society and Environment***, **Elsevier** 10:47-55. Doi: 10.1016/j.rsase.2018.02.004

28. Kumar P, Sajjad H, Tripathy BR, **Ahmed R,** Mandal VP (2017) Prediction of spatial soil organic carbon distribution using Sentinel-2A and field inventory data in Sariska Tiger Reserve. ***Natural Hazards*, Springer** 90(02): 693–704. DOI: 10.1007/s11069-017-3062-5

29. Jamil M, **Ahmed R** and Sajjad H (2017) Land suitability assessment for sugarcane cultivation in Bijnor district, India using geographic information system and fuzzy analytical hierarchy process. ***GeoJournal,*** **Springer**83(03): 595–611**.** DOI: 10.1007/s10708-017-9788-5

30. **Ahmed R**, Sajjad H and Husain I (2017) Morphometric parameters based prioritization of sub-watersheds using fuzzy analyticalhierarchy process: A case study of Lower Barpani watershed, India. ***Natural Resources Research,*** **Springer,** 27: 67-75. DOI: 10.1007/s11053-017-9337-4

31. Kumar P, Sajjad H, Alare RS, Elvidge CD, **Ahmed R**, and Mandal VP (2017) Analysis of Urban Population Dynamics Based on Residential Buildings Volume in Six Provinces of Pakistan Using

Operational Linescan System Sensors. ***IEEE Sensors Journal***, 17(06): 1656 – 1662. DOI: 10.1109/JSEN.2017.2652720

32. **Ahmed R**, Sahana M and Sajjad H (2016) Preparing turbidity and aquatic vegetation inventory for waterlogged wetlands in Lower Barpani sub-watersheds (Assam), India using geospatial technology.***The Egyptian Journal of Remote Sensing and Space Sciences,*** Elsevier.** 20: 243-249. Doi: 10.1016/j.ejrs.2016.11.001

33. Sahana M, **Ahmed R**, Jain P and Sajjad H (2016) Driving force for forest fragmentation explored by land use change in Song watershed, India. **Spatial Information Research** 24(06): 659–669DOI: 10.1007/s41324-016-0062-6

34. Jain P, **Ahmed R** and Sajjad H (2016), Assessing and monitoring forest health using a forest fragmentation approach in Sariska Tiger Reserve, India. ***NorskGeografiskTidsskrift–Norwegian Journal of Geography***, 70(05): 306-315 Doi: 10.1080/00291951.2016.1239655

35. **Ahmed R** and Sajjad H (2016) Derivation of ecological indicators for assessing landscape health and habitat disturbance in Lower Barpani watershed of Assam (India).***Forum geografic*** XV(1): 80-90, DOI:10.5775/fg.2016.018.i

36. Sahana M, **Ahmed R** and Sajjad H (2016), Analyzing land surface temperature distribution in response to land use/land cover change using split window algorithm and spectral radiance model in Sundarban Biosphere Reserve, India. ***Modeling Earth Systems and Environment***, **Springer** Vol. 2, Issue 2, Page 2-11, Doi: 10.1007/s40808-016-0135-5.

37. Sahana, M., Sajjad, H. and **Ahmed, R.** (2015), Assessing Spatio-temporal Health of Forest cover using Forest Canopy Density Model and Forest Fragmentation Approach in Sundarban Reserve Forest, India. ***Modeling Earth Systems and Enveironment***, **Springer**. 1: 49. DOI: 10.1007/s40808-015-0043-0.

38. Sahana M, **Ahmed R,** Hossain N and Sajjad H (2015), Assessing Flood Inundation and Landscape vulnerability to Flood using Geospatial Technology: A Study of Malda District of West Bengal, India, ***Forum Geographic***. XIV: 156-163.Doi: 10.5775/fg.2067-4635.2015.144.d

39. **Ahmed R** and Sajjad H **(2015)** Crop acreage estimation of Boro Paddy using Remote Sensing and GIS Techniques: A Case from Nagaon district, Assam, India. ***Advances in Applied Agricultural Science*** 03: 16-25.

40. **Ahmed R,** Sahana M and Sajjad H **(2014)** Assessment of seasonal agricultural land use dynamics using geospatial techniques: A case study of lower Barpani watershed, Assam. ***The Geographical Observer.*** 44: 11-18.

Chapter in Edited Book

1. Sahana, M., Rehman, S., **Ahmed, R**., & Sajjad, H. (2022). Assessing the Impact of Disasters and Adaptation Strategies in Sundarban Biosphere Reserve, India: A Household Level Analysis. In ***Challenges of Disasters in Asia: Vulnerability, Adaptation and Resilience*** (pp. 241-259). Singapore: Springer Nature Singapore.
2. Sahana, M., Rehman, S., Dutta, S., Parween, S., **Ahmed, R.,**&Sajjad, H. (2021). Evaluating Adaptation Strategies to Coastal Multihazards in Sundarban Biosphere Reserve, India, Using Composite Adaptation Index: A Household-Level Analysis. In ***India: Climate Change Impacts, Mitigation and Adaptation in Developing Countries*** (pp. 99-123). Springer, Cham.
3. Rahaman, M. H., Rehman, S., **Ahmed, R.,**&Sajjad, H. (2021) Exploring Carrying Capacity of Water and its Potential Sources in Imphal City, Manipur. In ***Water Supply for the Urban Poors in Indian Cities***
4. **Ahmed, R**., Kumar, P., & Rani, M. (2021). Introduction to Challenges and Future Directions in Remote Sensing and GIScience. In ***Remote Sensing and GIScience*** (pp. 3-7). Springer, Cham.
5. **Ahmed, R.,** Singh, R., &Sajjad, H. (2021). Landslide Susceptibility Mapping Using Bivariate Frequency Ratio Model and Geospatial Techniques: A Case from KarbiAnglong West District in Assam, India. In ***Remote Sensing and GIScience*** (pp. 59-73). Springer, Cham.
6. Jain, P., **Ahmed, R**., Sajjad, H., Sahana, M., Jaafari, A., Dou, J., & Hong, H. (2021). Habitat suitability mapping of sloth bear (Melursusursinus) in the Sariska Tiger Reserve (India) using a GIS-based Fuzzy analytical hierarchy process. In ***Remote sensing and GIScience*** (pp. 205-227). Springer, Cham.
7. Rani M, Kaliraj S, **Ahmed R**, Tripathy B, Tripathy BR, Pippal GS. (2019) A Sediment Dynamic Modelling of Landsat OLI Image for Suspended Sediment Drift Along the Southwest Coast of India. ***Kumar et al.*** edited, In ***Applications and Challenges of Geospatial Technology*** (pp. 141-159). Springer, Cham.

Paper presented in Conference

1. **Ahmed, R** (2024), "Characteristics of Wetlands in Morigaon district (Assam) using Optical Remote Sensing Techniques" 44th Annual Meet and international conference on Shaping Tomorrow: Society, Culture and Environment in an Interconnected World, organized by Department of Geography, Cotton University, Guwahati, 22nd to 24th January, 2024.

2. **Ahmed, R** (2018), "Assessing groundwater potential zones and its relation with population distribution in the Lower Barpani watershed, Assam" National conference on Role of Geospatial Technologies in Good Governance and Sustainable Development, organized by Interdisciplinary Department of Remote Sensing and GIS Applications, Aligarh Muslim University, Aligarh, 17th to 19th February, 2018**.**

3. **Ahmed, R** (2017), "Soil erodibility based prioritization of Lower Barpani watershed using morphometric parameters and fuzzy analytical hierarchy process" National Conference on Geoinformatics for Natural Resource Management Organized by Department of Geography, Faculty of Natural Sciences, Jamia Millia Islamia New Delhi, 7th to 8th February 2017.

4. **Ahmed, R** (2016), "Assessing landslide susceptibility for disaster management : A study of Hamren sub-division of KarbiAnglong district, Assam" ICSSR Sponsored Two Day National Seminar onClimate Change and Sustainable Development in India: Problems and Challenges, Organized by Meerut College, Meerut, 13th to 14th Nov, 2016.

5. **Ahmed, R** (2016),"Assessing Land Use/land Cover Changes Driven by Changing River Course in Lower Damodar River Basin, India Using Remote Sensing and GIS Techniques" 9th International Geographical Union (IGU) Conference on Land Use Change, Climate Extreme and Disaster Risk Reduction, organized by Department of Geography, Shaheed Bhagat Singh College, University of Delhi, India from 18-20th march 2016.

6. **Ahmed, R**(2015),**"**Integrated approach for assessing forest health in Indian Sundarban Reserve using remote sensing and GIS", XXXV INCA International Congress on Spatial Governance for Development, Planning Smart Cities and Disaster Management, Organized by Indian National Cartographic Association (INCA), In collaboration withCentre for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru University, New Delhi, 15th to 17th December, 2015.

7. **Ahmed, R.** (2015) "Geo-database for landslide susceptibility mapping of Hamren sub-division of KarbiAnglong district in Assam, India." XXXV INCA International Congress on Spatial Governance for Development, Planning Smart Cities and Disaster Management, Organized by Indian National Cartographic Association (INCA), In collaboration with Centre for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru University, New Delhi, 15th to 17th December, 2015.

8. **Ahmed, R.** (2015) "Monitoring health of landscape ecology using geospatial techniques: Evidence from Lower Barpani watershed, Assam." 37th Indian Geography Congress 2015 on Tourism Resources, Environment and Development with Remote Sensing and GIS Techniques, organized by the Department of Geography, University of Jammu, Jammu (J&K) In collaboration with National Association of Geographers, India, 2-4 December 2015.

9. **Ahmed, R.** (2015) "Mapping and characterization of waterlogged wetlands using Remote Sensing and GIS: A Case Study of Lower Barpani Sub-Watersheds (Assam), India". 9th DGSI International Geography Conference on Tourism, Environment and Development, Organized by the University Department of Geography, Magadh University, Bodh Gaya, 26-28 February 2015.

Personal Detail

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