

Dr. Pampiya Chowdhury

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Professional Profile

- Geologist and higher-education faculty with teaching and research experience in hydrogeology, groundwater assessment, remote sensing, GIS, environmental geology and applied geospatial analysis. Associated with the Department of Geology, Asutosh College, Kolkata since 2015, with experience in UG and PG teaching, field-based geological training, practical instruction and applied research.
- Research interests include groundwater potential mapping, hydrogeochemistry, GIS-based multi-criteria analysis, lineament and hydrogeomorphological analysis, environmental assessment, and application of Earth-observation data to geological and water-resource problems.

Areas of Expertise

- Hydrogeology and Groundwater Resource Assessment
- Groundwater Potential-Zone Mapping and Aquifer Characterisation
- Groundwater Hydrochemistry and Water-Quality Assessment
- Remote Sensing for Geological, Environmental and Water-Resource Applications
- GIS and Spatial Analysis / Multi-Criteria Decision Analysis
- Environmental Geology and Pollution Assessment
- Hydrogeomorphology, Lineament and Drainage Analysis
- Geological Mapping, Field Geology and Applied Geology
- Mineral Exploration and Geospatial Applications in Earth Sciences
- UG/PG Teaching, Practical Training, Field Training and Student Project Guidance

Academic Qualifications

Ph.D. in Geology — Jadavpur University, Kolkata (2018)

M.Sc. in Applied Geology

Professional Experience

Department of Geology, Asutosh College, Kolkata (2015 – Present)

- UG and PG teaching in Geology / Applied Geology, with emphasis on hydrogeology, water management, remote sensing, GIS and applied geological subjects.
- Teaching of Hydrogeology and Water Management at M.Sc. Applied Geology level, including hydrological cycle, groundwater occurrence, aquifers, water table/piezometric surface and groundwater provinces.
- Practical and field training in geological mapping, hydrogeological interpretation, remote sensing and GIS-based analysis.
- Preparation of teaching materials, practical exercises, field-viva resources, GIS exercises and mineral-exploration/resource-estimation exercises.
- Student guidance in applied geological research and geospatial studies.

Research Profile

- Groundwater potential mapping in hard-rock terrains
- Basaltic aquifer systems and secondary porosity/permeability
- GIS-based multi-criteria decision analysis for groundwater exploration
- Groundwater hydrochemistry and suitability assessment
- Remote sensing and GIS for environmental monitoring
- Pollution mapping and spatial modelling
- Hydrogeomorphology, lineament density and drainage analysis
- Water-resource management and rainwater harvesting

Selected Software & Technical Proficiency

- **ArcGIS:** Advanced working proficiency in spatial analysis, raster processing, weighted overlay, thematic mapping, DEM analysis and map preparation.
- **QGIS:** Advanced working proficiency in georeferencing, digitisation, spatial analysis, raster/vector processing and cartographic layout.
- **RockWorks:** Working proficiency in geological/hydrogeological data visualisation and subsurface data interpretation.
- **Remote Sensing workflows:** Working knowledge in satellite-image interpretation, thematic-layer generation and GIS integration.
- **Geospatial analysis:** Working knowledge in DEM derivatives, drainage/lineament density, weighted overlay and multi-criteria modelling.

Research Projects & Professional Engagements

- **Integrated groundwater-potential assessment – Pakur District, Jharkhand (2026):** Lead/co-author research using GIS and remote sensing, geology, geomorphology, slope, drainage density, lineament density, soil and rainfall in a weighted-overlay framework. The study evaluates the hydrogeological significance of weathered/fractured Rajmahal Trap Basalt and uses seasonal groundwater-level data for validation.
- **Groundwater potential assessment – Khatra Block, Bankura, West Bengal:** Research involving geospatial analysis and multi-criteria evaluation for groundwater-potential delineation in hard-rock terrain.
- **Groundwater hydrochemistry – Khatra Block, Bankura, West Bengal:** Research on pre- and post-monsoon groundwater samples, including field measurement of pH, TDS and EC and assessment of groundwater quality and suitability.
- **GIS-based assessment of pollution distribution along Ganges city outfalls, West Bengal:** Collaborative research involving spatial analysis and software-based modelling of seasonal and tidal influences on pollutant distribution, specifically focusing on formal analysis and software application.
- **Bhasa Campus Rainwater Harvesting Project, South 24 Parganas, West Bengal:** Institutional engagement as a member of the working team from 2017 onward. The project was sponsored by the Government of West Bengal and aimed to improve rainwater infiltration, groundwater availability and campus sustainability.

Publications

- Nag, S.K., Chowdhury, P. (2019). Decipherment of potential zones for groundwater occurrence: a study in Khatra Block, Bankura District, West Bengal, using geospatial techniques. *Environmental Earth Sciences*, 78(2). DOI: 10.1007/s12665-018-8034-x.
- Nag, S.K., Chowdhury, P. (2019). A study on groundwater hydrochemistry in Khatra Block, Bankura district, West Bengal. *Sustainable Water Resources Management*, 5(2). DOI: 10.1007/s40899-019-00319-0.
- Nag, S.K., Chowdhury, P. (2021). Deciphering prospective groundwater zones in Bankura district, West Bengal: a study using GIS platform and MIF techniques. *International Journal of Energy and Water Resources*, 5(3), 323–341. DOI: 10.1007/s42108-020-00110-4.
- Kar, S., Ghosh, I., Chowdhury, P., Ghosh, A., Aitch, P., Bhandari, G., RoyChowdhury, A. (2022). A model-based prediction and analysis of seasonal and tidal influence on pollutants distribution from city outfalls of river Ganges in West Bengal, India and its mapping using GIS tool. *PLOS Water*. DOI: 10.1371/journal.pwat.0000008.
- Chowdhury, P., Thapa, J. (2026). Finding Ground water Potential zones in Jharkhnad's Pakur District through the use of geospatial and multi criteria decision making techniques. *Research Square preprint*, posted 19 March 2026. DOI: 10.21203/rs.3.rs-8846850/v1.

Academic / Institutional Contributions

- Member, institutional Rainwater Harvesting Plant working team at Bhasa Campus from 2017 onward.
- Academic/resource contributor in a 2022 public-interaction programme on sustainable groundwater management organised with the Central Ground Water Board, Eastern Region, Kolkata; topic: Ground Water Pollution in and around Kolkata Megacity.

Field & Applied Geology Capabilities

- Hydrogeological reconnaissance and groundwater-resource interpretation
- Groundwater-level and seasonal fluctuation analysis
- Hydrochemical data interpretation and groundwater suitability assessment
- Thematic mapping and integration of geological and environmental datasets
- DEM-derived slope, drainage and terrain analysis
- Lineament extraction/density analysis and hydrogeomorphological interpretation
- Weighted-overlay / multi-criteria GIS modelling
- Field teaching, geological observation and practical training