

Terms of Reference (TOR)

Position: Senior Data Scientist

Meghalaya Basin Development Authority (MBDA)

Background and Context:

Meghalaya Basin Development Authority (MBDA) is the nodal agency of the Government of Meghalaya entrusted with the planning, implementation, and monitoring of development programmes across watershed and basin areas of the state. MBDA oversees a diverse portfolio of programmes and projects funded by the Government of India, State Government, and various international development agencies.

MBDA generates and manages substantial volumes of data across its project portfolio — encompassing financial data, beneficiary information, field-level monitoring reports, GIS-linked spatial data, and performance metrics aligned to the Logical Framework Approach (LFA) of multiple funding agencies. The Authority is committed to strengthening its Management Information System (MIS) infrastructure, operationalising a unified data analytics platform, and building an institutional capacity for evidence-based decision-making.

To lead and anchor these efforts, MBDA invites applications from qualified professionals for the position of Senior Data Scientist. The incumbent will be the principal technical resource responsible for all aspects of data management, MIS operations, dashboard development, and data-driven programme monitoring across MBDA and its projects.

Objectives of the Assignment:

The primary objectives of the Senior Data Scientist role are:

1. To design, develop, and operationalise a robust, centralised MIS platform that integrates data from all MBDA projects and programmes.
2. To build and maintain interactive, real-time dashboards that provide programme managers, senior leadership, and funding agencies with timely and actionable insights.
3. To lead the collection, cleaning, transformation, and analysis of large and complex datasets generated across MBDA operations.
4. To establish and maintain Monitoring and Evaluation (M&E) metrics in alignment with the requirements of MBDA's diverse funding agencies and reporting frameworks.
5. To ensure data governance, data quality, security, and integrity across all MIS and analytics systems.
6. To support the end-to-end digital transformation of MBDA's project monitoring functions, working closely with internal teams, field staff, and external technology vendors.

Scope of Work and Key Responsibilities:

1. MIS Design, Development and Operations

- Assess the current state of data systems, MIS infrastructure, and reporting workflows across all MBDA/MBMA projects and prepare a detailed MIS Needs Assessment Report.
- Design and implement a centralised, scalable MIS architecture integrating data from field operations, financial systems, beneficiary databases, and programme monitoring tools.

- Develop and maintain ETL (Extract, Transform, Load) pipelines to ingest data from diverse sources including spreadsheets, third-party applications, government portals, and field data collection platforms.
- Set up and manage cloud-based data storage solutions including data lakes and data warehouses on AWS (Amazon Web Services) or equivalent platforms, ensuring security, scalability, and cost efficiency.
- Maintain and administer relational (RDBMS) and non-relational (NoSQL) databases supporting MBDA operations.
- Define and enforce data governance standards, data dictionaries, naming conventions, and data quality protocols across all systems.

2. Dashboard Development and Data Visualisation

- Design and develop interactive, web-based MIS dashboards using Tableau, Power BI, or equivalent tools, tailored to the reporting needs of programme managers, the CEO, and external funding agencies.
- Build programme-specific dashboards tracking key performance indicators (KPIs), financial expenditure, physical progress, beneficiary outreach, and M&E metrics.
- Develop automated reporting pipelines that generate periodic reports (weekly, monthly, quarterly, annual) with minimal manual intervention.
- Ensure dashboards are mobile-responsive and accessible to field-level staff where required.
- Provide training and documentation to internal teams for dashboard usage and interpretation.

3. Data Analysis and Exploratory Data Analysis (EDA)

- Conduct in-depth exploratory data analysis on programme data to identify trends, outliers, patterns, and areas requiring intervention.
- Apply statistical analysis, predictive modelling, and data science techniques to generate insights that inform programme design, mid-course corrections, and strategic decision-making.
- Develop and maintain analytical models using Python and/or JavaScript to automate repetitive analytical tasks and generate standardised outputs.
- Conduct data quality audits and prepare data quality reports at regular intervals.

4. Monitoring, Evaluation and Reporting

- Collaborate with the M&E team and programme leads to define, document, and operationalise Monitoring and Evaluation (M&E) frameworks, indicators, and data collection protocols for each project.
- Map M&E indicators to the specific reporting requirements of funding agencies (Government of India, State Government, World Bank, GEF, IFAD, or other development partners as applicable).
- Prepare data-driven progress reports, MIS reports, and analytical briefs for submission to funding agencies, Government bodies, and MBDA/MBMA leadership.
- Support preparation of Annual Progress Reports (APR), Mid-Term Reviews (MTR), and End-Term Evaluations (ETE) through data aggregation and analysis.

5. GIS and Spatial Data Management

- Work with GIS data to spatially map project activities, beneficiary locations, watershed boundaries, and infrastructure assets.
- Integrate GIS layers with the MIS platform to enable spatial analytics and location-based reporting.
- Apply working knowledge of the Local Government Directory (LGD) codes to ensure data linkages are correctly aligned to administrative hierarchies (State, District, Block, Village/GP levels).
- Liaise with GIS specialists and external mapping agencies to validate and update spatial datasets as required.

6. Vendor and Stakeholder Coordination

- Lead the end-to-end management of technology vendor engagements for MIS, dashboard, and analytics platform development — including specification writing, procurement support, UAT, and go-live.
- Coordinate with multiple internal and external stakeholders including project managers, field teams, finance staff, government officials, and international agency representatives.
- Prepare comprehensive technical specifications, Request for Proposals (RFP), and evaluation criteria for procurement of IT/data services.
- Monitor vendor performance against agreed SLAs and escalate issues as necessary.

Desired Qualifications:

Graduate or Post Graduate degree in Computer Science, Data Science, Economics, Statistics, Information Technology, or other closely related quantitative disciplines from a recognised university. A Post Graduate degree or doctoral qualification will be an added advantage.

Desired Experience and Technical Skills:

1. Core Technical Experience

- Minimum of five (5) years of progressively responsible experience in IT/MIS management and data analytics roles in supervisory level.
- Expert-level proficiency in JavaScript and Python programming languages, including experience building data pipelines, automation scripts, and API integrations.
- Expert-level proficiency in databases — both relational (PostgreSQL, MySQL, MS SQL Server, or equivalent RDBMS) and non-relational (MongoDB, DynamoDB, or equivalent NoSQL) systems.
- Expert-level knowledge of statistics and Exploratory Data Analysis (EDA) techniques including descriptive statistics, inferential analysis, regression modelling, and visualisation of statistical outputs.
- Demonstrated experience in designing and implementing Monitoring and Evaluation (M&E) metrics systems and mapping them to the reporting requirements of Government or international funding agencies.
- Hands-on experience with ETL systems, data integration frameworks, data lakes, and data warehouse architectures (e.g., AWS Redshift, Glue, S3, or equivalent).

- Practical experience with AWS cloud services including but not limited to EC2, S3, RDS, Lambda, Glue, and Athena.
- Demonstrated experience handling and processing large, complex, and multi-source datasets.
- Working experience with GIS data (spatial analysis, map integration) and a basic understanding of the Local Government Directory (LGD) codes and administrative hierarchy structures in India.
- Expert-level proficiency in data visualisation and business intelligence tools — Tableau, Power BI, or equivalent platforms — including dashboard design, data modelling, and publishing.
- Prior experience working with Government agencies, PSUs, autonomous bodies, or international development institutions (World Bank, UNDP, GEF, IFAD, or similar) is strongly preferred.

2. Essential Requirements

- Excellent written and verbal communication skills in English; ability to prepare high-quality reports, presentations, and technical documents for diverse audiences including senior leadership, government officials, and international agency representatives.
- Demonstrated experience coordinating and collaborating with multiple stakeholders simultaneously — including programme teams, field staff, finance units, government departments, and external partners.
- Proven experience working directly with technology vendors to manage the end-to-end implementation of IT and data systems — from requirements scoping and RFP preparation through to deployment, UAT, and post-go-live support.
- Flexibility and willingness to work beyond standard hours including weekends and public holidays whenever operational or reporting requirements necessitate.
- Willingness to travel within Meghalaya and other states as required for field data collection, stakeholder meetings, and project review activities.
- High degree of integrity, confidentiality, and commitment to data accuracy and institutional accountability.

Preferred Additional Skills (Desirable but Not Mandatory):

- Experience with machine learning frameworks (scikit-learn, TensorFlow, or equivalent) for predictive analytics in a development sector context.
- Familiarity with mobile data collection platforms (KoboToolbox, ODK, CommCare, or equivalent) used in field-level M&E.
- Experience with QGIS, ArcGIS, or similar GIS tools for spatial data analysis and mapping.
- Knowledge of development sector reporting frameworks such as Results Frameworks, Log Frames, and Theory of Change models.
- Experience with DevOps practices, version control (Git), and containerisation (Docker/Kubernetes).
- Certification in AWS, Google Cloud, Microsoft Azure, or a recognised data science/analytics platform.

- Knowledge of Hindi and/or Khasi/Garo will be an advantage for stakeholder engagement in the field.

Reports To	Executive Director, MBDA / Designated Project Head
Works Closely With	Project Managers, M&E Team, Finance Division, IT Team, Field Staff, and external funding agency representatives.
Place of Posting	MBDA Head Office, Shillong (with field visits as required)
Working Hours	Standard MBDA/MBMA office hours; must be available on weekends and holidays when required by operational or reporting deadlines
Travel	Travel within Meghalaya and to other states as needed for project reviews, workshops, and field data collection
Review Mechanism	Performance will be reviewed at the end of six (6) months and annually thereafter against agreed deliverables and KPIs

9. Reporting and Working Arrangements:

Remuneration

The remuneration for this position shall be commensurate with the qualifications and experience of the selected candidate, and in line with MBDA/MBMA norms and guidelines.
