

COMPLETION REPORT

VALUE-ADDED PROGRAMME

Application of Drone – Based Remote Sensing in Geography: Prospects and Opportunities
*Under the Aegis of Viksit Bharat Abhiyan***Organized by:** Department of Geography, Loreto College, Kolkata**Collaborators:** Geotech Solutions**Duration:** 30 hours (Offline Mode)**Duration:** March 7, 2025 – March 26, 2025**Introduction**

In recent years, the application of drone-based remote sensing has revolutionized the field of Geography by providing an efficient, accurate, and cost-effective means of collecting spatial data. Unlike traditional methods, drones—also known as Unmanned Aerial Vehicles (UAVs)—offer the ability to capture high-resolution imagery and real-time information from hard-to-reach or hazardous areas. By enhancing data precision and reducing fieldwork time, drone-based remote sensing has become an



indispensable tool for geographers, enabling more informed decision-making and fostering deeper insights into Earth's dynamic systems.

The programme commenced from March 7, 2025. Semester VI students of the Department of Geography, Loreto College, Kolkata along a student from neighbouring college had enrolled for the same.

The sessions were structured to blend theoretical insights with hands-on training. Mr. Ayan Ghosh, the resource person, conducted live drone demonstrations, showcasing flight techniques and real-time data capture. Participants had the opportunity to engage in data acquisition activities, followed by guiding sessions on processing and analyzing the collected data using GIS tools.

To facilitate a comprehensive understanding of drone-based remote sensing workflows, a range of geospatial and flight management software was utilized. This included GPS **Waypoints** for setting and navigating specific field locations, **Google Earth Pro** for spatial referencing, **OJI Fly** for drone operation, and **ArcGIS** for data visualization and modeling. The integration of these tools enabled participants to gain real-world experience in managing, analyzing, and interpreting geospatial data using industry-standard platforms.

Recognizing the transformative impact of emerging geospatial technologies on the discipline, the Department of Geography, Loreto College, Kolkata organized a **Value-added Programme on Application of Drone-Based Remote Sensing in Geography: Prospects and Opportunities**, in collaboration with the Internal Quality Assurance Cell.

Mr. Ayan Ghosh, IT Personnel (GIS Engineer), Special Investigation Division, CAD-GIS Centre, Public Health and Engineering Department, Government of West Bengal, was invited as the resource person to help students learn the use and importance of drone technology and its application in the discipline of Geography.

Programme Content:

- I. Drone technology in Geography
- II. Hands-on Data Acquisition with drones
- III. Hands-on Data Processing and Analysis
- IV. GIS Mapping and Interpretation

Learning Objectives

1. Understand the fundamental principles and applications of UAV (drone) technology in geographical research and spatial data collection.
11. Acquire practical skills in operating drones for data acquisition in field settings.
111. Process and analyze aerial data using remote sensing software and techniques.
- IV. Apply Geographic Information System (GIS) tools for mapping, Interpretation, and spatial decision-making.
- v. Evaluate the potential and limitations of drone-based remote sensing in various geographic and environmental studies.

Learning Outcomes

At the end of the course, participants were able to;

- I. Demonstrate an understanding of the principles, components, and operational mechanisms of Unmanned Aerial Vehicles (UAVs) and their relevance in spatial data collection.
11. Operate drone systems safely and efficiently for the purpose of acquiring geospatial data in field settings.
111. Interpret and analyze geospatial data through GIS tools to draw meaningful geographical insights.
- IV. Identify real-world applications of UAV technology in environmental monitoring, land use studies, and spatial planning.
- V. Reflect on the ethical and regulatory considerations surrounding the use of drones in field research.



