

## Monthly Report (February 2025)

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### Abhay Pal

- Part of ground team in Mapping of 27 Slum Areas in Dehradun.
  - Conducted drone simulator training and gave lectures on drones components and application of drones in disaster management to NDRF officials.
  - Engaged with empanelled drone companies to collect their previous work done in their domain and documentation of summary of their proposed drone services and work experience.
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### Deepak Bhandari

- RFP for Image Processing Software
  - Empanelment of Companies for Drone as a service in Uttarakhand
    - Prepared the work plan
    - Prepared the Digital Booklet for Departments and Public
  - Mapping of Malin basti's near Rispana River
    - Coordinated with Nagar Nigam, Dr. Priyadarshi and Team
  - RPTO Documentations
  - EOI Evaluation for Drone Ports Corridors & UTM
  - DPR Summarisation of Drone Ports, Corridors & UTM.
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### Satyam Agrawal

- Go to field with Nagar Nigam team for Mapping of 'Malin Basti' of Dehradun.
  - Gave a lecture to the officials of the "NDRF" on 11th Feb to 15 Feb. (Drone Parts, Simulation & Practical Flying Session)
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### Saurabh Chaubey

#### 1. Field Visit – Nagar Nigam (Malin Basti Mapping, Dehradun)

- Conducted drone-based mapping.
- Captured high-resolution aerial data & processed survey results.

#### 2. NDRF Training Session (11th–15th Feb)- Drone Operation

- Drone control, movement, and safety protocols.
- Flight Planning & Mission Execution Training.
- Practical Flying Session Training.
- DGCA Drone Rules Training.

#### 3. Preparation of Digital Booklet for Departments.

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## **Saurabh Maheshwari**

- Mapping of 27 areas of Slums of Dehradun on 4th, 5th and 6th Feb.
- Image processing of the drone images of Slum Area on Pix4dMapper.
- Gave a lecture to the officials of the NDRF on 11th Feb. on 2D & 3D Mapping and Photogrammetry.

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## **Shubham Sharma**

- Conducted a training to NDRF officials on 10th Feb to 14th Feb 2025.
- Presented a lecture of Introduction to Drones, Drone Maintenance and Pre and Post flight Checkups.

## Monthly Report (March 2025)

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### Abhay Pal

- Gave lectures on Application of drones in Defence, Drone Data extraction and Analysis and Simulator training to ITBP Officials from 3-7 march Batch 1.
  - Exhibited in the Science Festival held in “Hindu National Inter College, Dehradun.
  - Attend drone training provided by Asteria Aerospace of RPTO Drones.
  - Gave lectures on Application of drones in Defence, Drone Payloads and types , Drone Data extraction and Analysis and Simulator training to ITBP Officials from 24-28 march Batch 2.
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### Deepak Bhandari

- Exhibited in the Science Festival held in “Hindu National Inter College, Dehradun.
  - RPTO Documents correction and resubmission
  - Drone Training for ITBP, 2 Batches 3rd to 7th March & 24th to 28th March
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### Satyam Agrawal

- Participate in Science Festival held in “Hindu National Inter College, Dehradun”
  - Conducted a training to ITBP officials on 3rd March to 7th March 2025
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### Saurabh Chaubey

1. Exhibited in the Science Festival held in “Hindu National Inter College, Dehradun.
  2. **ITBP Training Session (3th–7th march)- Drone Operation**
    - Drone control, movement, and safety protocols.
    - Drone Simulator Training.
    - Practical Flying Session Training.
    - DGCA Drone Rules Training.
  3. Attend drone training provided by Asteria Aerospace of RPTO Drones.
  4. **ITBP Training Session (24th–28th march)- Drone Operation**
    - Drone control, movement, and safety protocols.
    - Practical Flying Session Training.
    - DGCA Drone Rules Training.
    - Drone Simulator Training.
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### Saurabh Maheshwari

- Gave a lecture to the officials of the ITBP on 4th March and 6 March on 2D & 3D Mapping and Photogrammetry of Batch 1.
- Attend drone training provided by Asteria Aerospace of RPTO Drones.
- Gave a lecture to the officials of the ITBP on 25th and 28th March on 2D & 3D Mapping and Photogrammetry of Batch 2.

- Updated the TPM for the RPTO process.
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### **Shubham Sharma**

- Conducted a training on Introduction to Drones and brief about components to ITBP Officials from 3-7 march Batch 1.
- Exhibited in the Science Festival held in “Hindu National Inter College, Dehradun.
- Attend drone training provided by Asteria Aerospace of RPTO Drones.
- Conducted a training on Brief Introduction of Drones and its components to ITBP Officials from 24-28 march Batch 2.3

## Monthly Report (April 2025)

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### Abhay Pal

- Gave lectures on Application of drones in Defence to two batches of BSF Officials
  - Preparation for RPTO Inspection:
    - Drafted RPTO Proposal document for public disclosure
    - Designed Banners and posters for ITDA RPTO.
    - Drafted UAS Training Handbook and UAS Training Session Summary documents.
    - Lab Setup with the team for RPTO Inspection.
    - Drafted SOP for Student Admission and Certification
  - Coordinated with Asteria for extraction of System Logs of RPTO drones.
  - Reviewed RPTO logbooks and attendance records with Shubham Sharma.
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### Deepak Bhandari

#### 1. RPTO Inspection Preparation and Execution

##### a. Pre-Inspection Preparation

- Conducted extensive groundwork for upcoming RPTO (Remote Pilot Training Organization) inspection in coordination with DGCA.
- Ensured all prerequisites were in place, including:
  - Finalizing documentation related to operations, SOPs, safety protocols, and training manuals.
  - Verifying and updating infrastructure such as classrooms, simulators, drone bays, and other RPTO-mandated assets.
  - Ensuring availability and readiness of required personnel (Instructors, Maintenance Staff, Safety Managers, etc.).
  - Conducting internal mock drills and compliance checks to ensure inspection readiness.

##### b. DGCA RPTO Inspection Coordination

- Successfully hosted and coordinated the official RPTO inspection visit by the DGCA Team.
  - Provided complete walkthrough and documentation access during inspection.
  - Managed on-ground coordination between internal team and DGCA inspectors.
  - Addressed and resolved real-time queries from DGCA during the inspection.
  - Facilitated smooth interaction between DGCA, Accountable Manager, instructors, and administrative staff.
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### Saurabh Chaubey

#### 1. BSF Training Session (1st April)- Drone Operation

- Practical Flying Session Training.

#### 2. Preparation for RPTO Inspection:

- Making field setup for the inspection of RPTO.
- Prepared logbooks for the RPTO inspection.
- Setup of Lab and Simulation room with the team for the inspection of RPTO.

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**Saurabh Maheshwari**

- **Preparation for RPTO Inspection:**
    - Prepared layout for the field design using QGIS/Google Earth.
    - Making field setup for the inspection of RPTO.
    - Prepared documents for the RPTO inspection.
    - Setup of Lab and Simulation room with the team for the inspection of RPTO.
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**Shubham Sharma**

- Conduct a training for BSF Officials in two batches.
  - RPTO Process
    - Prepared required document for the admission process in RPTO.
    - Coordinated with PRD for the Flying Ground for RPTO.
    - Set up of the Classroom, Battery Charging Station, Banners and Simulator Room for the RPTO.
    - Lab Setup with team for RPTO Inspection.
    - Drafted Handbook/ Study Material for the Participants.
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## Monthly Report (May 2025)

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### Abhay Pal

- Gave lectures on Introduction to drones & components and application of drones in defence to ITBP officers in a one day training on 3rd may.
  - Dehradun Slum area change detection:
    - Worked on marking change detection in slum area between 2024 & Feb 2025 with Saurabh Chaubey & Saurabh Maheshwari.
    - Conversion of all slum mapping TIFF files to ECW format
    - Worked on slum change detection presentation with the team.
  - Gave lectures on Drone forensic, application of drones in defence and conducted drone simulator training to ITBP officials in two 5 day training from 19th to 23rd may and 26th to 30th may 2025
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### Deepak Bhandari

#### Slum Change Detection Analysis & Presentation

- Conducted geospatial analysis for Slum Change Detection (2022–2024) focused on *Malin Basti areas near Rispana River*.
- Processed multi-temporal satellite imagery to identify urban expansion and encroachment patterns.
- Extracted meaningful insights related to environmental impact, unauthorized construction, and land use change.
- Developed a detailed visual presentation showcasing comparison maps, statistics, GIS overlays, and possible interventions.

#### DARC Achievements Presentation

- Designed and compiled a comprehensive presentation on DARC's achievements and activities over the past few years.
- Included highlights from drone operations in various sectors: agriculture, surveillance, disaster response, training, and policy implementation.
- Structured the presentation to reflect DARC's growth, contributions, collaborations, and vision for the future.

#### Presentation Delivery & Stakeholder Briefing

- Delivered both presentations to internal stakeholders including:
    - Department Coordinators, USAC Team
    - Senior Officials of Company
    - Director Sir
  - Successfully explained technical aspects and project relevance to both technical and non-technical audiences.
  - Received constructive feedback and engaged in discussions for future directions and planning.
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## **Saurabh Chaubey**

**1. Completed digitization of slum area boundaries, and conducted change detection (2024–Feb 2025) with Abhay Pal & Saurabh Maheshwari.**

### **2. ITBP Training Session (19th–23th )- Drone Operation**

- Drone control, movement, and safety protocols.
- Simulator Training
- Practical Flying Session Training.
- DGCA Drone Rules Training.

### **3. ITBP Training Session (26th–30th )- Drone Operation**

- Drone control, movement, and safety protocols.
- Simulator Training
- Practical Flying Session Training.
- DGCA Drone Rules Training.

4. Provided practical drone flying training to ITBP officials during a one-day training program on 3rd may.

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## **Saurabh Maheshwari**

- Create the shapefiles for the change detection on the Slum Basti of Rispana River between (2022-2024) and (2024-2025)
  - Prepared the presentation on slum basti on the change detection.
  - Gave lecture to the ITBP Officials on Drone Flight Planning and GIS Mapping on 20th, 23rd May, and 27th, 30th May, 2025.
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## **Shubham Sharma**

- Conduct five days training for ITBP Officials (First Batch).
    - Presented a lecture on Introduction to Drones and Components of Drones.
    - Presented a lecture on Equipment and Maintenance.
    - Training on Simulator
  - Drafted a Training Curriculum for One Day Training, Three Day Training and Five Day Training for College Students, Armed Forces and State Departments.
  - Conduct Five days Training for ITBP Officials (Second Batch).
    - Presented a lecture on Introduction of Drones.
    - Presented a lecture on Equipment and Maintenance.
    - Training on Simulator
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## Monthly Report (June 2025)

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### Abhay Pal

- Worked with team on presentation on Works, achievements & events conducted by DARC till date.
  - Showcased DARC Lab and work to BSF Commandant during his visit.
  - Prepared Brief version of DARC works presentation as per drone coordinator's instructions.
  - Extracted and shared Drone log of 2 RPTO drones for fault mitigation to Asteria Engineers.
  - Attended Uttarakhand Space Meet 2025 conducted by USAC.
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### Deepak Bhandari

- Attended **Uttarakhand Space Meet 2025** conducted by USAC.
  - Attended the workshop on **Leveraging Space Technology for Viksit Bharat 2047** in USAC.
  - Conducted professional photography and videography at locations identified by UCOST for the ***Maa Dhara Naman Project***.
    1. Captured high-quality aerial and ground visuals to document project sites effectively.
    2. Ensured coverage of all designated areas as per project requirements.
    3. Organized and stored media files for further processing and official use.
    4. Prepared video for presentation.
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### Saurabh Chaubey

- Digital Drone Booklet
    1. Compiled and structured department-wise drone service details (Agriculture, Mapping, PWD, Mining) with defined use cases and benefits.
    2. Prepared technical scope, deliverables, and file formats for each department in a concise, standardized format.
    3. Documented common specifications including drone types, sensors, workflow process, and compliance standards.
    4. Designed and formatted the drone digital booklet with relevant visuals and infographics for departmental reference.
  - Attended **Uttarakhand Space Meet 2025** conducted by USAC.
  - Presented the DARC Lab and its projects to the BSF Commandant during his visit, together with Abhay.
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**Saurabh Maheshwari**

- Prepared and designed Digital Drone Booklet with Department-wise Use cases along with Saurabh Chaubey.
  - Attended Uttarakhand Space Meet 2025 conducted by USAC.
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**Shubham Sharma**

- Attended the workshop on **Leveraging Space Technology for Viksit Bharat 2047** in USAC.
  - Meeting with BSF Commandant Mr. Manoj Painoli and discuss the Application of Drones in the Defence Sector.
  - Attended **Uttarakhand Space Meet 2025** in USAC.
  - Photography and Videography of location identified by UCOST for **Maa Dhara Naman Project**.
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## Monthly Report (July 2025)

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### Abhay Pal

- Gave lectures on Drone payloads, Drone forensic, application of drones in defence and conducted drone simulator training to ITBP officials in two 5 day training from 7th to 11th July and 14th to 18th July 2025
  - Mentored three WIT Dehradun college interns on a drone assembly and calibration project, provided hands-on guidance through all stages, including hardware assembly and system calibration.
  - Conducted night drone photography with Deepak to assess the feasibility of monitoring streetlights using drones at night.
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### Deepak Bhandari

- Conducted the Night drone flights to assess the feasibility of night mapping.
  - Design and Developed the Web platform for Drone photogrammetry maps in Python flask using Geoserver, Firebase, HTML, CSS, JS.
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### Saurabh Chaubey

1. **ITBP Training Session (7th–11th )- Drone Operation**
    - Drone control, movement, and safety protocols.
    - Simulator Training
    - Practical Flying Session Training.
    - DGCA Drone Rules Training.
  2. **ITBP Training Session (14th–18th )- Drone Operation**
    - Drone control, movement, and safety protocols.
    - Simulator Training
    - Practical Flying Session Training.
    - DGCA Drone Rules Training.
  3. Conducted slum mapping of the Bindal area using drone-based survey techniques for accurate spatial data collection and analysis.
  4. Delivered a lecture to Uttarakhand Technical University students on drone technology, applications, and operational best practices.
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### Saurabh Maheshwari

- Conducted slum mapping of the Bindal area using drone-based survey techniques for accurate spatial data collection and analysis on 7th July.
- Complete Image Processing of the Bindal Mapping of Slum areas using Agisoft Metashape.
- Digitized some areas of Bindal Slum area.
- Gave Training to the officials of the ITBP on GIS Mapping and Flight Planning on (8th and 11th July) and (15th and 18th July).

- Gave Training/support to the newly joined Phd. intern of USAC under the guidance of Dr. Gajendra Singh (Scientist C).
  - Handover the data and laptop to Deepak Bhandari on 31st July.
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#### **Shubham Sharma**

- Conduct five days training for ITBP Officials (First Batch).
    - Presented a lecture on Introduction to Drones and Components of Drones.
    - Presented a lecture on Equipment and Maintenance.
    - Training on Simulator
  - Conducted slum mapping of the Bindal area using drone-based survey techniques for accurate spatial data collection and analysis.
  - Conduct Five days Training for ITBP Officials (Second Batch).
    - Presented a lecture on Introduction of Drones.
    - Presented a lecture on Equipment and Maintenance.
    - Training on Simulator
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## Monthly Report (August 2025)

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### Abhay Pal

- Inventory & Asset Allocation
    - Compiled an inventory list of items allocated to DARC Lab and updated newly allocated resources.
    - Created a detailed list of items currently with ITDA, identifying those requiring transfer to USAC for asset allocation.
  - Research & Development Projects
    - Integrated model optimization techniques for low-power edge inference like on Raspberry Pi, including:
      - Quantization to INT8 precision
      - Making model lite for deployment on low power computing devices using NCNN framework
    - Researching on AI-driven flood forecasting approaches and open source models available online.
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### Deepak Bhandari

Feature addition to the web portal for drone maps.

1. Server live report
  2. Print/export map view.
  3. Profile management
  4. Registration and login
  5. Detail dashboard with analytics
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### Saurabh Chaubey

1. Conducted drone mapping and data processing, including capturing photos and videos for the Street Light Project.
  2. Prepared Standard Specifications of Drone for reference and project requirements.
  3. Compiled a Specification List of Mapping Drones through coordination and communication with drone companies.
  4. Prepared a List of Government Departments possessing drones.
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### Shubham Sharma

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