



## • Team Details:

### • Team Name

**Phantom**

### • Team members

- **Parvez Ali:** *Parvez Ali – Team Lead & Aspiring Software Engineer:* Project planning, development, and integration of core features.  
<https://linkedin.com/in/urparvezali>
- **Arman Islam:** *– Technical and Idea Supporter:* Contributes to brainstorming, technical problem-solving, and implementation strategies.  
<https://cv-of-arman.netlify.app>
- **Lamia Islam:** *– Marketing and Presentation Specialist:* Focuses on design, communication, and effectively presenting the project to judges and audiences.
- **MD. Basim Al Zabir Shammo:** *– Aspiring Researcher & AI Specialist:* Leads data analysis, model development, and research-driven improvements.

### • Team Summary

Together, our team combines technical expertise, research skills, creativity, and presentation ability allowing us to approach real-world problems from multiple perspectives and create impactful AI-driven solutions for society.

# Core Idea – GreenLift AI

## Main Concept:

GreenLift AI is an integrated, eco-friendly drone delivery and AI-powered business intelligence platform designed specifically for SMEs in Bangladesh. It combines autonomous green-fuel VTOL drones with a real-time AI dashboard that turns sales, inventory, and delivery data into actionable insights, enabling SMEs to operate efficiently, grow sustainably, and make data-driven decisions.

## Problem Addressed:

- SMEs struggle with inaccurate demand forecasting, inefficient inventory management, limited cash flow visibility, and poor customer retention.
- Traditional delivery systems are slow, costly, and unsustainable, while analytics solutions are often complex, expensive, and inaccessible for small businesses.
- This prevents SMEs from scaling efficiently in a digital and environmentally-conscious market.

## Proposed Solution:

- Green-Fuel VTOL Drones: Autonomous, energy-efficient drones for fast, reliable delivery, even in urban congestion or rural areas.
- AI-Powered SME Dashboard: Converts raw business data into demand forecasts, inventory alerts, cash flow predictions, and customer insights.
- Seamless Integration: Data from drone deliveries, POS systems, and payments creates a closed-loop intelligence system that improves over time.
- Localized & Affordable: Bangla interface, mobile-first design, subscription/pay-per-use model ensures easy adoption by SMEs.

## Unique / Innovative Aspect:

- First-of-its-kind integration of green logistics + AI intelligence for SMEs.
- Sustainability-first approach with hydrogen-electric drones reducing carbon footprint.
- Self-learning data loop: every delivery improves predictive analytics for demand, inventory, and routing.
- Localized and inclusive design: Bangla interface, voice alerts, offline capabilities, low-cost access, and minimal technical skill required.

- Creates a scalable, adaptive, and socially impactful ecosystem for SME growth, employment, and eco-conscious business practices.

## Feasibility & Growth Potential – GreenLift AI

### Realistic Implementation:

- Leverages existing technology: VTOL drones, green hydrogen-electric propulsion, AI analytics, cloud infrastructure, and mobile payments.
- Phased rollout: Prototype → urban pilot → regional expansion → nationwide scaling.
- Micro-drone hubs in cities and towns ensure efficient logistics, while AI dashboards provide actionable insights.
- Partnerships with regulators, energy providers, telecoms, and finance platforms ensure smooth operations and compliance.

### Practicality:

- SME-friendly adoption: Bangla-first, mobile-first interface; voice alerts; offline-capable dashboards.
- Low entry barrier: Subscription + pay-per-delivery model eliminates upfront investment.
- Reliable operations: Redundant drones, predictive maintenance, and AI-driven routing reduce downtime.
- Minimal technical skill required; training and local support hubs ensure smooth integration for SMEs.

### Market Differentiation:

- Integrated delivery + AI analytics: Unlike traditional couriers or standalone analytics, GreenLift AI combines both in one platform.
- Sustainability-first approach: Green-fuel drones reduce emissions, noise, and urban congestion.
- Localized & inclusive: Designed for rural and urban SMEs with low tech literacy.
- Cost-effective: More affordable than separate courier + analytics solutions.
- Competitive Moat: Data-driven AI improves with every delivery; early regulatory alignment and modular hubs create barriers for competitors.

### Growth Potential:

- Large market: Over 10 million SMEs in Bangladesh; expanding e-commerce and digital adoption create demand for last-mile delivery and AI insights.
- Scalable model: Modular drone hubs, cloud-native AI, and micro-hubs enable urban-to-rural nationwide coverage.
- Revenue streams: Subscriptions, pay-per-delivery, premium analytics, and eco-credit programs.
- Phase-wise SME adoption ensures gradual growth and learning for AI optimization.
- Expansion opportunities: Sector-wise (healthcare, agriculture, retail) and regional (neighboring South Asian markets).
- Social & environmental impact: Job creation, SME empowerment, and carbon reduction reinforce growth and brand loyalty.

Summary:

GreenLift AI is technically feasible, economically viable, and socially impactful. Its phased implementation, practical adoption, and strong market differentiation make it highly scalable, with significant growth potential across Bangladesh's SME ecosystem and beyond.

## Technology Stack – GreenLift AI

Hardware:

- VTOL Drones: Payload 1–20 kg, range 20–50 km, hydrogen-electric hybrid propulsion for eco-friendly delivery.
- Sensors & Navigation: LiDAR, GPS, IMU, optical flow cameras, AI-assisted flight control.
- Drone Micro-Hubs: Modular rooftops/warehouses for storage, charging, and dispatch.
- Charging & Refueling: Hybrid electric + hydrogen stations, solar-assisted optional.
- IoT Devices: Telemetry, environmental monitoring, connectivity modules (4G/5G/LoRaWAN).

Software:

- AI Analytics Engine: Demand forecasting, inventory management, cash flow, customer segmentation (Python, TensorFlow, PyTorch).
- Flight Control & Routing: Autonomous drone navigation (ROS, PX4 autopilot, AI path planning).
- SME Dashboard: Web & mobile apps (React.js, Flutter), localized in Bangla, visual & voice alerts.
- Data Integration: Connects POS, payment apps, e-commerce platforms (REST/GraphQL, ETL pipelines).
- Monitoring & Alerting: Real-time drone status and anomaly detection (Prometheus, Grafana).

## Integration:

- Drone-to-Cloud Communication: Real-time telemetry via 4G/5G or LoRaWAN.
- Unified API Gateway: Connects drones, SME dashboards, payments, and POS systems.
- Edge Computing Modules: Local decision-making for offline or low-connectivity areas.

## Communication Protocols:

- Drone ↔ Hub: MQTT / LoRaWAN / 4G
- Hub ↔ Cloud: HTTPS / REST API
- Cloud ↔ Dashboard: WebSocket / HTTPS
- Inter-drone: V2V mesh network for collision avoidance and cooperative routing

## Cloud Infrastructure:

- Hosting: AWS, Azure, or GCP for central AI processing and storage.
- Database: PostgreSQL/MySQL for structured data; MongoDB for NoSQL storage.
- AI/ML Processing: SageMaker or TensorFlow Serving for predictive analytics.
- Backup & Redundancy: Multi-region replication for disaster recovery.
- Dashboard Hosting: CDN-enabled cloud for low-latency access.

## Security Protocols:

- Data Transmission: TLS 1.3 encryption, VPN tunnels.
- User Access: Multi-factor authentication (MFA) and RBAC.
- Cloud Data: AES-256 encryption at rest; secure backups.
- Drone Firmware: Signed updates, secure boot.
- API Integration: OAuth 2.0, token-based authentication.

## Optional Advanced Features:

- AI edge processing at micro-hubs (NVIDIA Jetson)
- Predictive drone maintenance via IoT sensors
- Fleet optimization AI for dynamic routing
- Eco-metrics dashboard for carbon and energy tracking

## Summary:

GreenLift AI combines cutting-edge drone hardware, AI-powered analytics, cloud infrastructure, and robust security into a scalable, reliable, and SME-friendly system. It enables real-time delivery, actionable insights, and sustainable operations across urban and rural Bangladesh.

## Feasibility & Growth Potential

### Realistic Implementation:

- Initial pilot with open satellite data (Sentinel-2, Landsat) and historical cyclone datasets.
- Prototype within hackathon: segment flooded and damaged zones using pretrained segmentation models (U-Net / SegFormer).
- Expandable to integrate drones or smartphone images crowdsourced by volunteers.

### Practicality:

- Easily scalable across coastal districts.
- Compatible with existing government systems like DMD (Disaster Management Department) and BMD data APIs.
- Relies on publicly available geospatial datasets — minimal cost barrier.

### Market Differentiation:

- Unlike traditional GIS tools, ReliefVision adds AI-driven intelligence to automate classification and relief decision-making.
- Focused on Bangladesh's local challenges, rather than global generic models.

### Growth Potential:

- Can evolve into a national disaster monitoring platform supporting floods, droughts, and river erosion.
- Potential collaborations with UNDP, BRAC, and BMD for real-world deployment.

# Technology Stack & AI Tools

## Programming Languages:

- Python / Rust (data & model development)
- JavaScript / TypeScript (dashboard frontend)

## Frameworks & APIs:

- FastAPI / Flask – backend API
- React / Next.js – web dashboard
- Leaflet.js / Mapbox – map visualization
- Google Earth Engine API – satellite data integration

## AI Tools:

- U-Net / ResNet / SegFormer – image segmentation
- YOLOv8 – object detection for damaged buildings
- Scikit-learn / PyTorch / TensorFlow – model training
- GeoPandas / Rasterio – spatial data processing

## Cloud Tools:

- Google Cloud / AWS S3 – data hosting and compute
- Firebase – real-time dashboard backend
- Streamlit / Gradio – demo interface for hackathon

## Security Protocols:

- Role-based access control for authorized agencies
- Data encryption (AES-256) for satellite imagery and user data
- HTTPS for all web communications
- OAuth2 for secure API access

# Project Impact

## Target:

Cyclone-affected rural and coastal communities in Khulna, Barishal, Patuakhali, Satkhira, and Cox's Bazar districts, along with government and NGO disaster response teams.

## Impact Metrics:

- Assessment time reduced from days to hours
- Accuracy of damage classification > 85%
- Relief distribution optimization — reaching 30% more households efficiently
- Coverage area per analysis — > 500 km<sup>2</sup> per satellite batch

## Social & Economic Impact:

- Ensures faster relief and recovery, saving lives and resources.
- Supports transparent and data-driven decision-making in disaster management.
- Reduces economic loss by enabling early rehabilitation planning.
- Empowers local volunteers and authorities with accessible AI tools.

