



TowerGuard

Data-driven restoration intelligence for Kenya's forests

Protecting Kenya's Future, One Seedling at a Time

Who We Are

TowerGuard transforms forest restoration through intelligent monitoring systems that prove conservation impact with trustworthy, verifiable metrics.

Our Mission

Competing in the Wangari Maathai Hackathon Track 2: Data-Driven Impact Measurement, we're building the infrastructure to amplify conservation success across Kenya.



The Crisis in Kenya's Forests

50K

Hectares Lost

Over 50,000 hectares of Kenyan forest disappear every year while monitoring budgets continue to shrink

\$3

Per Hectare

Average monitoring spend leaves roughly 70% of restoration plots completely unverified each year

70%

Unverified

Most restoration sites lack reliable data

Counties, community groups, and financiers lack a shared system of record to unlock climate finance and ESG deals. Global restoration pledges—including 15 billion trees in Kenya alone—require verifiable metrics before billions in funding can flow.



Our Vision: Every Seedling Measurable



Nursery to Canopy

Track every seedling from germination through mature forest growth using automated monitoring systems



Unified Intelligence

Combine satellite imagery, field apps, and AI into one streamlined M&E workflow delivering alerts within 24 hours



Track 2 Alignment

Survival tracking, dashboards, nursery mapping, biodiversity visualization, AI impact prediction—all integrated

TowerGuard will provide trusted data for the first 250,000 hectares of Kenya's 15 billion tree pledge and scale far beyond.



Built for Everyone in the Restoration Ecosystem

Community Groups

Forest associations gain real-time insights to optimize planting strategies and demonstrate impact to funders

01

Survival Intelligence

Anomaly detection refreshed every five days using 10-meter Sentinel satellite scenes

04

Biodiversity Lens

Species richness monitoring and camera-trap integrations tracking 5,000+ annual observations

Regulators & Counties

KFS and county governments access unified dashboards for oversight, compliance, and resource allocation

02

M&E Control Room

Comprehensive dashboards, reporting packs, and exports with complete audit trails to raw imagery

05

AI Impact Studio

Scenario planning models projecting five-year ecological and financial outcomes

Investors & CSR

Carbon developers and ESG investors receive verifiable metrics with full audit trails for confident financing

03

Nursery Atlas

Species mix optimization, capacity forecasts, and procurement workflows covering 40+ nurseries



Enterprise-Grade Technology Stack

Lightning-Fast Processing

FastAPI microservices with Celery workers complete ingestion jobs in just 15 minutes, keeping data fresh and actionable

Intelligent AI Models

TorchGeo + PyTorch models process approximately 1 TB of raster data annually with hectare-level explainability for transparent insights

Robust Infrastructure

PostgreSQL + PostGIS feature store, Redis queues handling 10,000+ daily events, React + MapLibre dashboards with 50+ KPI widgets

Seamless Data Pipeline

1

Satellite Ingestion

Sentinel/Landsat + rainfall/soil APIs refresh hourly

2

Field Collection

USSD/Kobo/LoRa capture 2,000+ monthly observations

3

Intelligence Engine

Feature store snapshots power scoring with <10s latency

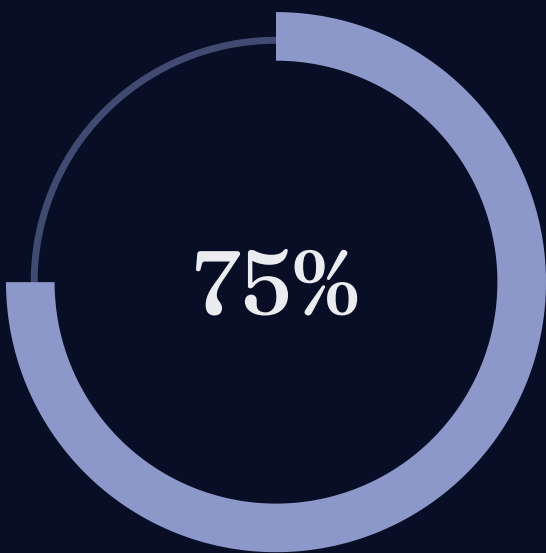
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Evidence Locker

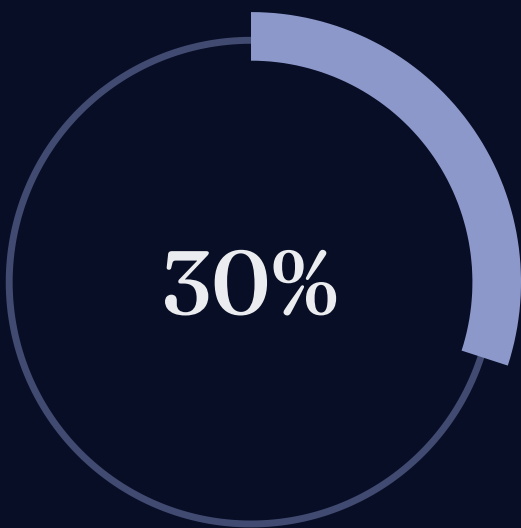
Tamper-proof PDF/CSV exports for audits



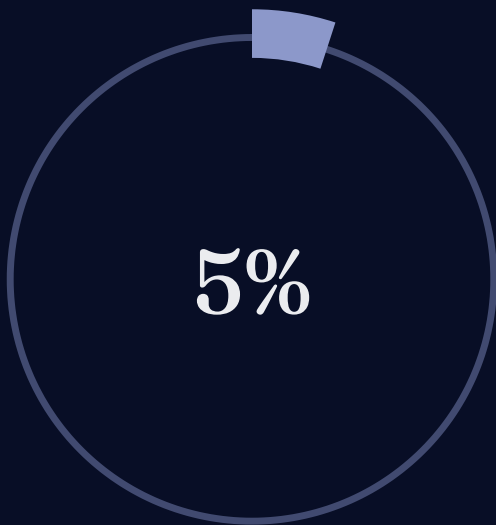
Measurable Impact Where It Matters Most



Target Survival Rate
Lift pilot sites from 55% to 75% seedling survival with precise interventions



Shortage Reduction
Reduce seedling supply gaps across monitored regions



Biodiversity Growth
Year-over-year increase in indicator species across restoration zones

Real Success: Nyeri Block 7

TowerGuard alerts enabled our team to identify and replant a failing section within one week. Expected survival jumped from 48% to 71%, protecting both our investment and the forest's future.



25,000 hectares monitored by 2026

Scaling intelligent oversight across Kenya's most critical restoration zones



2,000 seasonal jobs documented per county

Proving the socioeconomic impact of restoration alongside ecological gains

Sustainable Business Model



Multiple Revenue Streams

Diversified approach ensures long-term sustainability while serving diverse stakeholders across the restoration ecosystem.

SaaS Subscriptions

Pilot tier at \$18K/year, enterprise at \$75K/year with >70% gross margins providing predictable, scalable revenue

Usage Credits

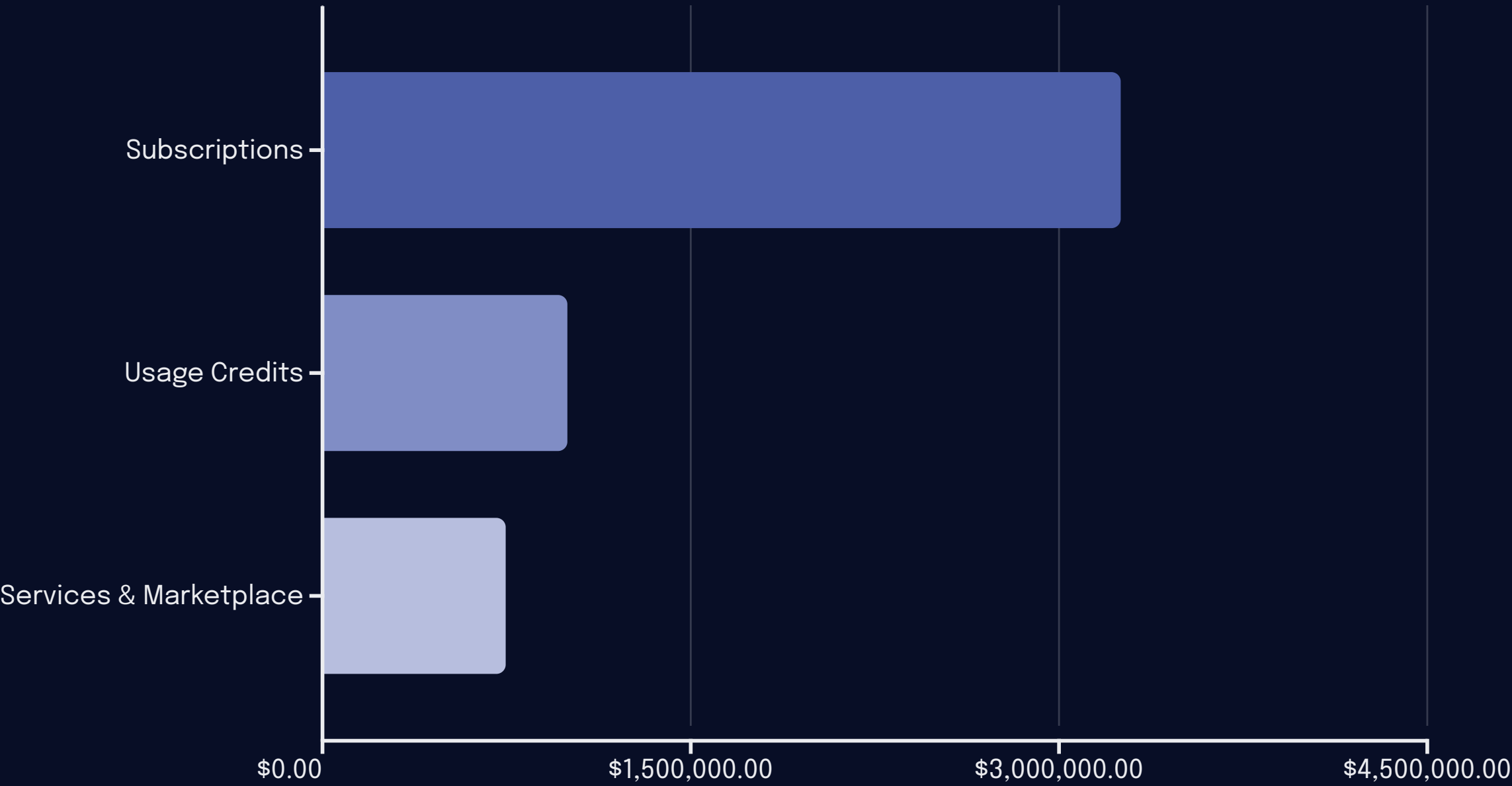
Pay-as-you-grow model at \$0.04 per data event ensures accessibility for smaller organizations

Premium Services

AI scenarios, audits, and custom integrations billed at \$150/hour for specialized needs

Future Growth: Restoration Marketplace

By 2027, a 5% facilitation fee on nursery supply and restoration services will create a marketplace targeting \$2M GMV, connecting buyers and sellers while generating platform revenue.



Path to \$5M ARR by year three with a balanced mix delivering resilience and growth.

Strategic Go-To-Market Approach



Our Competitive Edge

<p>Offline-First Design</p> <p>Field teams work seamlessly in remote areas without internet connectivity, syncing when connection returns</p>	<p>Transparent Metrics</p> <p>Every calculation includes explainability and audit trails, building trust with regulators and investors</p>
<p>Unified Platform</p> <p>Single system covering survival, nurseries, biodiversity, and finance—eliminating fragmented tools</p>	<p>Privileged Partnerships</p> <p>Deep collaboration with KEFRI, KFS, and county governments provides unique data access and validation</p>

From Hackathon to Scale: Our Roadmap



Hackathon Sprint: Foundation

Delivered prototype data model, dashboard wireframes, and 18 stakeholder interviews validating product-market fit



Q1 2025: MVP Launch

Ingest Sentinel scenes, deploy MVP dashboards, onboard 20 pilot nurseries across initial counties



Q2 2025: Intelligence Layer

Launch AI impact prediction studio and donor evidence packs covering 50,000 hectares



Q3 2025: Monetization & Expansion

Activate subscription tiers, integrate payment systems, expand to Rwanda with 3 paying counties



Join Us in Restoring Kenya's Forests

TowerGuard transforms ambitious restoration pledges into verified reality. With transparent data, intelligent automation, and a sustainable business model, we're building the infrastructure for Kenya's 15 billion tree future.

Together, we can make every seedling count.