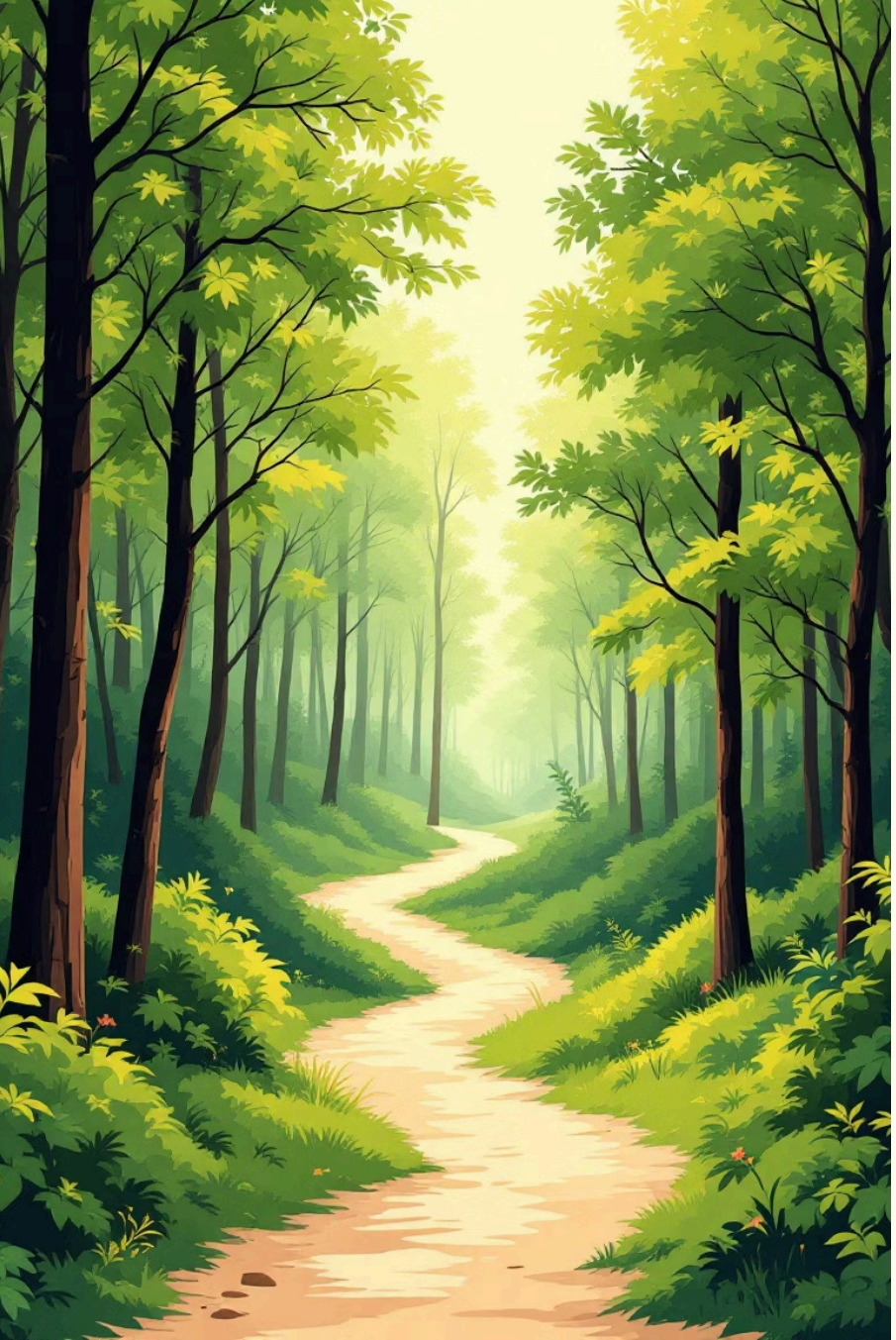

MsituMum – Forest Restoration Intelligence System

MsituMum is an innovative, end-to-end forest restoration intelligence platform. It's meticulously designed to empower Kenyan farmers, community groups, NGOs, donors, and government restoration officers with the tools they need to bring deforested lands back to life.

A Coordinated Ecosystem for Restoration Success

MsituMum seamlessly connects every aspect of forest restoration, from nursery management to long-term impact assessment. Farmers and field teams effortlessly input data, which the system transforms into actionable insights.

Nursery Operations

Efficient seedling production & tracking.

AI-Powered Predictions

Forecasting impact & risks.

Planting Activities

Optimized site selection & methods.

Biodiversity Monitoring

Tracking ecological recovery.

Satellite Observations

Remote sensing for health & growth.

This integrated approach ensures every effort contributes to a resilient and thriving ecosystem.

Core Features: Tracking & Monitoring

MsituMum provides robust tools for precise tracking and interactive monitoring, delivering clear insights into restoration progress and impact.

Tree Survival Rate Tracking

Record planting details (species, GPS, methods) and monitor growth (height, canopy, health). Automated analytics provide survival curves, site-level rates, mortality breakdowns, and cross-site comparisons.

Interactive M&E Dashboards

Access real-time metrics, planting distribution heat maps, farmer group productivity, and cost-per-surviving-tree calculations. Visual timelines with photo logs ensure transparent progress for all stakeholders.

These features ensure data-driven decisions and transparent reporting for all partners involved in the restoration efforts.

Smart Nursery & Biodiversity Management

Optimize seedling health and track ecological recovery with MsituMum's advanced management features.

Smart Nursery Management

- **GPS-based Location Detection:** Instant location capture for all nursery beds.
- **Automatic Soil Analysis:** Climate-aware soil mix recommendations (e.g., 25% sand, 45% loam, 30% compost for tropical zones).
- **Intelligent Watering:** Climate-specific watering schedules for optimal growth.
- **Inventory & Capacity:** Track species, quantities, germination rates, and bed availability.

Biodiversity Visualization

- **Species Richness Tracking:** Monitor before and after species presence.
- **Wildlife Sighting Logs:** Document fauna with photos and timestamps.
- **Ecological Recovery Maps:** Visualize restoration impact on local biodiversity.
- **Biodiversity Index Charts:** Quantify and track ecosystem health.

AI-Powered Impact Predictions

Harness the power of Artificial Intelligence to forecast restoration outcomes and mitigate risks, ensuring long-term success.

Comprehensive Input Data

Species, location, climate, soil, maintenance history, satellite data (NDVI, EVI), and rainfall patterns feed the AI.

Actionable Prediction Outputs

Get 1, 3, and 5-year survival probabilities, expected biomass, carbon sequestration, and risk scores (drought, pests).

Smart Recommendations

Receive tailored advice for watering, mulching, and shade management, along with confidence intervals for predictions.

Under the Hood: Robust Technology

MsituMum is built on a modern, scalable technology stack designed for performance and reliability.

Backend Foundation

Node.js + Express.js for speed, Supabase (PostgreSQL) for robust data storage, and secure Supabase Auth with JWT.

Intuitive Frontend

Vanilla JavaScript for responsiveness, styled with Tailwind CSS for a sleek interface, and custom SVG charts for data visualization.

Cloud Infrastructure

Leveraging Supabase for database & authentication, with plans to integrate Cloudinary for image storage and Google Maps API for enhanced mapping features.

This powerful architecture ensures MsituMum remains a cutting-edge solution for forest restoration.