

# SEEDENCE

## Revolutionizing Environmental Monitoring with Blockchain-Verified Insights

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### Abstract

Seedence is an innovative solution designed to enhance transparency and accountability in global tree-planting initiatives. By leveraging satellite imagery, artificial intelligence, and blockchain technology, Seedence provides verifiable, tamper-proof audit trails for environmental projects. This proposal outlines the problem context, proposed solution, technology stack, process flow, and anticipated social impact of Seedence.

## Problem Statement

- **Unverified Plantings:** Millions of trees are planted globally without post-planting survival verification.
- **Fund Mismanagement:** Billions of dollars allocated for climate funds risk being unverified due to inadequate audit mechanisms.
- **Slow Audits:** Manual verification processes are inefficient, delaying timely data-driven decisions.

## Proposed Solution

Seedence addresses these challenges through a comprehensive environmental monitoring system that includes:

- **AI Monitoring:** Utilizes satellite imagery and artificial intelligence (AI) models such as YOLOv8, LSTM, and Meta Segment Anything to monitor tree growth, detect deforestation, and assess forest health.
- **Blockchain Verification:** Securely hashes and stores monitoring results on a blockchain, ensuring tamper-proof, publicly verifiable audit logs.
- **Public Access:** Provides transparent, real-time access to data for stakeholders including NGOs, governments, and donors.

## Technology Stack

- **Satellite Data:** Sentinel-2, PlanetScope
- **AI Algorithms:** Meta Segment Anything, YOLOv8, LSTM
- **Fraud Detection:** OpenAI Synthetic Training Data
- **Infrastructure:** Python, AWS, Node.js

## Process Flow

1. **Input:** Satellite/Drone Imagery Acquisition
2. **Preprocessing:** Image enhancement and data preparation
3. **AI Analysis:** Growth detection, deforestation identification, forest health assessment
4. **Flagging/Validation:** Detection of anomalies and data verification
5. **Hashing & Logging:** Creation of secure, tamper-proof blockchain records
6. **Dashboard/API Access:** User-friendly interface and data integration for stakeholders

## Social Impact and Feasibility

### Social Impact

- Enhances transparency and accountability in climate projects.
- Supports NGOs, governments, and donors with reliable, verifiable data.

### Feasibility

- Satellite-first design eliminates the need for IoT-based sensors.
- Open-source ready, enabling broad adoption and community-driven enhancements.
- Scalable and adaptable across different geographic regions worldwide.