EcoQuest — Product Requirements Document (1 page)

Vision
Gamified, verifiable environmental actions for students—turn learning into measurable local impact.

Problem
Environmental education in many Indian schools is theoretical; students lack tools to apply learning and track real-world impact.

Target users
School & college students, teachers/eco-club coordinators, NGOs, municipal partners.

Core features (high level)
Map-based exploration; mission creation; photo+GPS submission; multi-signal verification (EXIF+ML+teacher/NGO); leaderboards; teacher dashboard; NGO & civic integration.

Verification & Safety
EXIF GPS + timestamp enforcement; ML image checks; teacher/NGO approval for high-value claims; parental consent & location obfuscation for minors; safety waivers for events.

Opportunity / Impact
Aligns with NEP 2020 experiential learning & SDGs. Converts student participation into verifiable local environmental improvements with school-level metrics for CSR and government reporting.

MVP (Must-haves)
Auth with parental consent; PWA/mobile; map with school markers; photo upload with EXIF+GPS; simple ML tree/trash filter; teacher approval flow; points, badges & leaderboards; basic impact dashboard & CSV export.

Tech choices (recommended)
React Native / PWA; Mapbox or Google Maps; Node.js + Postgres/PostGIS; S3-compatible storage; TF/PyTorch for server-side ML; Firebase Auth for quick onboarding.

KPI & Metrics
Active students/month; verified missions; trees planted; waste cleared (est. kg); schools onboarded; teacher approval turnaround; fraud rate (fraud attempts/total submissions).

Anti-fraud & Inclusion
Reputation & staking, ML+video for high-value claims, QR-tagged saplings for partner nurseries, SMS/WhatsApp gateway & teacher bulk upload for low-connectivity schools.

Project Description

EcoQuest is a mobile-first platform that gamifies verified environmental actions by students. Players discover nearby missions on a map (plant native saplings, conduct cleanups, audit waste segregation), complete real-world actions, and submit proof (photo with EXIF GPS/timestamp or short video). Submissions are verified through a multi-signal pipeline—automated ML checks, community validation, and teacher/NGO approval—before awarding Eco-Points and badges. Schools appear as aggregated impact nodes on the map, enabling inter-school competitions and exportable reports for NEP co-curricular credit, CSR engagement, and municipal collaboration. The product prioritizes privacy (parental consent, obfuscated public locations for minors), safety (adult supervision for events), and inclusion (PWA + SMS upload options).

Pilot recommendation: run an 8-week pilot with 3 schools + 1 local NGO to validate verification, measure teacher workload, and tune ML & point economy.