

PRODUCT REQUIREMENTS DOCUMENT (PRD)

Product Name

BlueCarbon Ledger

Tagline: *Unified Blue & Green Carbon Credit Platform*

1. Vision & Purpose

Vision

To build **digital trust infrastructure for climate action**, enabling farmers and landowners to prove their environmental impact and allowing companies to offset emissions with confidence, transparency, and traceability.

Problem We Solve

Climate action today suffers from a **trust and transparency gap**:

- Farmers and landowners restore land, plant trees, and protect ecosystems but lack a **credible digital way to prove impact**
- Companies want to offset emissions responsibly but fear:
 - Greenwashing
 - Fake or low-quality credits
 - Double counting
 - Opaque verification
- Existing systems rely heavily on:
 - Manual paperwork
 - Fragmented verification

- Centralized trust assumptions

As a result, **real climate action does not scale**, despite strong intent on both sides.

2. Product Overview

BlueCarbon Ledger is a **digital trust platform** that verifies, records, and secures real-world climate action using:

- GIS-based land identification (to prove *where* the land is)
- MRV reporting (to prove *what* is happening on the land)
- Independent two-factor verification
- Immutable audit trails
- Clear role separation to prevent conflicts of interest

Only **verified climate actions** can be converted into **voluntary carbon credits**, which are permanently retired and documented.

We are **not just trading credits** — we are building **trust infrastructure for climate action**.

3. Target Users & Personas

Primary Users

- **Farmers & Landowners**
 - Afforestation
 - Soil carbon improvement
 - Mangrove and coastal protection
 - Land restoration projects

Secondary Users

- **Independent Verifiers**
 - Environmental experts
 - NGOs
 - Auditors
 - Academic institutions
- **Corporate Buyers**
 - ESG-aware SMEs
 - Sustainability-focused companies
 - Brands seeking voluntary carbon offsets
- Immutable audit ledger

Explicitly Excluded (v1)

- Regulatory / compliance carbon markets
- Certified national or international registries
- Satellite-based automated carbon stock modeling
- AI-based verification

Tertiary Users (Future)

- Government bodies
- NGOs
- Research institutions
- Climate programs

4. Product Scope (v1)

Included

- Land-based nature projects (blue + green carbon)
- Public carbon estimator (optional add-on)
- GIS-based land mapping
- MRV-based verification workflow
- Role-based dashboards
- Credit issuance representation
- Credit retirement
- Carbon offset certificates

5. Core Product Modules

5.1 Public Carbon Estimator (Optional Add-on)

Purpose:
Educate companies and act as a low-friction entry point.

Key Characteristics:

- No login required
- Simple inputs (electricity, fuel, transport, employees)
- Provides:
 - Estimated annual CO₂ footprint
 - Suggested number of credits needed
- Clearly marked as:
“Indicative estimation for awareness and planning only”

CTA:

- “View verified projects”
- “Create account to offset emissions”

5.2 Contributor Land Registration

Inputs:

- Project type (forest, mangrove, soil, etc.)
- Location details
- Declared land area
- Project description
- Supporting documents (ownership, photos, plans)

MRV Inputs:

- Project activity description
- Photos and evidence
- Time-based updates (where applicable)
- Supporting documents

MRV Status:

- Pending
- Verified
- Rejected / Needs clarification

5.3 GIS-Based Land Mapping (Two-Factor Verification – Part 1)

How it works (v1):

- Contributor draws land boundary directly on a map (polygon)
- System automatically:
 - Calculates land area
 - Stores GPS coordinates
 - Saves boundary shape

Verification benefits:

- Confirms *where* the land exists
- Prevents duplicate or overlapping land claims
- Enables spatial validation against existing projects

This replaces “trust me” with “**see it on the map.**”

5.4 MRV Reporting (Two-Factor Verification – Part 2)

Purpose:

Prove *what is happening on the land.*

5.5 Verification Workflow (Governance-Centric)

Verifier Model:

Mixed model:

- Internal verification initially
- External NGOs / auditors onboarded over time

Verification Rules:

- Verifiers cannot verify their own projects
- All decisions are logged
- Rejections require reason codes
- No silent edits allowed after verification

6. Carbon Credit Representation & Retirement

Credit Issuance Model

- Platform does **not claim regulatory issuance**

- Credits are **voluntary digital representations**
- Designed to be compatible with future registry integrations
- Credits permanently removed from circulation
- Recorded in immutable audit ledger
- Cannot be reused or resold

Credit Rules

- Credits generated only after:
 - GIS verification
 - MRV approval
- Credits are:
 - Non-transferable after retirement
 - Locked against duplication
 - Traceable to land + project

Carbon Offset Certificate

Includes:

- Buyer details
- Project information
- Credits retired
- Verification reference
- Retirement date
- Audit trail ID

Claim Framing:

“Voluntary carbon offset for ESG and sustainability reporting.”

7. Marketplace & Buyer Flow

Marketplace Filters:

- Project type (blue / green)
- Verified status
- Available credits
- Required credits (based on estimator)

Purchase Inputs:

- Purpose: *Voluntary ESG / sustainability offset*
- Offset year
- Retirement option

9. Audit Ledger & Trust Infrastructure

Ledger Principles:

- Append-only
- No silent edits
- All actions logged:
 - Land registration
 - Verification decisions
 - Credit issuance
 - Credit retirement

This ledger is the **core trust layer** of the platform.

8. Credit Retirement & Certificate

Retirement

10. Non-Functional Requirements

Regulatory	Voluntary-only positioning
Verifier bias	Role separation, audit logs

Security

- Secure authentication
- Role-based access control
- Tamper-resistant logs

Transparency

- Buyer-visible verification status
- Clear disclaimers
- Public project metadata

Scalability

- Region-by-region onboarding
- Modular verifier expansion

11. Revenue Model (Early Stage)

- Platform fee per verified credit transaction
- Corporate buyer subscriptions
- Verification workflow tools for institutions
- Long-term government & NGO partnerships

12. Risks & Mitigation

Risk	Mitigation
Greenwashing accusations	Clear disclaimers, transparency, audit trails
Data falsification	GIS mapping + verification

13. Roadmap (High Level)

MVP

- GIS land mapping
- Manual verification
- Voluntary credits
- Public estimator

Phase 2

- External verifier onboarding
- Advanced MRV tooling
- Better analytics

Phase 3

- Satellite overlays
- Registry integrations
- Government pilots

14. Success Metrics (KPIs)

- Verified projects onboarded
- Credits retired (not just sold)
- SME adoption rate
- Verifier turnaround time
- Zero duplicate land claims

15. One-Line Summary (PRD Close)

BlueCarbon Ledger is a digital trust platform that verifies and secures real-world climate action so farmers can earn fairly and companies can offset emissions with confidence.