

# 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

#### 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

- Immutable audit ledger

### Explicitly Excluded (v1)

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

## 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 CO<sub>2</sub> 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)

## 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.*

### MRV Inputs:

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

### MRV Status:

- Pending
- Verified
- Rejected / Needs clarification

## 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

#### Credit Rules

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

## 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

## 8. Credit Retirement & Certificate

#### Retirement

- Credits permanently removed from circulation
- Recorded in immutable audit ledger
- Cannot be reused or resold

#### 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.”

## 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.

## 10. Non-Functional Requirements

### 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

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

## 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)

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**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.**