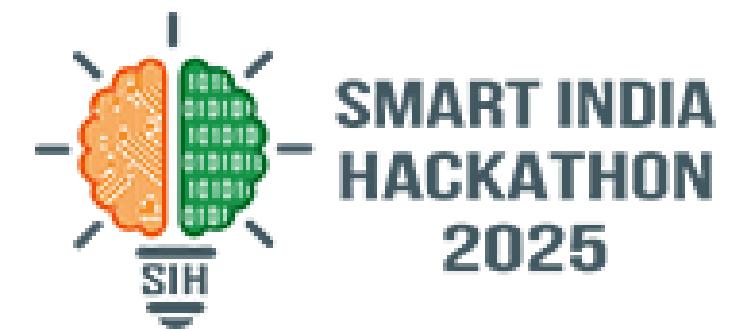


SMART INDIA HACKATHON 2025



- **Problem Statement ID – 25038**
- **Problem Statement Title – Blockchain-Based Blue Carbon Registry and MRV System**
- **Theme- Clean And Green Technology**
- **PS Category- Software**
- **Team ID - 73**
- **Team Name - GreenETH**



The Problem

- 1) The current carbon market is plagued by **opacity, fraud, and double-counting**, leading to widespread distrust and "greenwashing" accusations.
- 2) Traditional **MRV (Measurement, Reporting, and Verification)** is a slow, manual, and cost-prohibitive process that fails to provide auditable proof of climate impact.
- 3) This broken system hinders vital **climate finance** from reaching high-integrity projects, stalling global net-zero goals.

Our Solution

Decentralized Data Proof

Secure evidence via IPFS hashing

IDEA TITLE

Innovation and Uniqueness

Hybrid Governance Model

- Bridges the trust of decentralized tech with **NCCR (Government) compliance and validation**.

On-Chain Retirement & Traceability

- Tokens enable instant, auditable retirement, guaranteeing **Zero Double-Counting** and creating a public, full-lifecycle trace for every asset. (Focuses on the key benefit).

Decentralized MRV Vault

- Utilizes **IPFS and cryptographic hashing** to create a tamper-proof "data vault" for project proofs, resolving the core integrity issues in reporting. (Focuses on technical novelty).

Automated Oversight

Smart contracts manage approval workflow (Verifier → NCCR).

Time-to-Market Reduction

Eliminates paperwork, speeds up approval

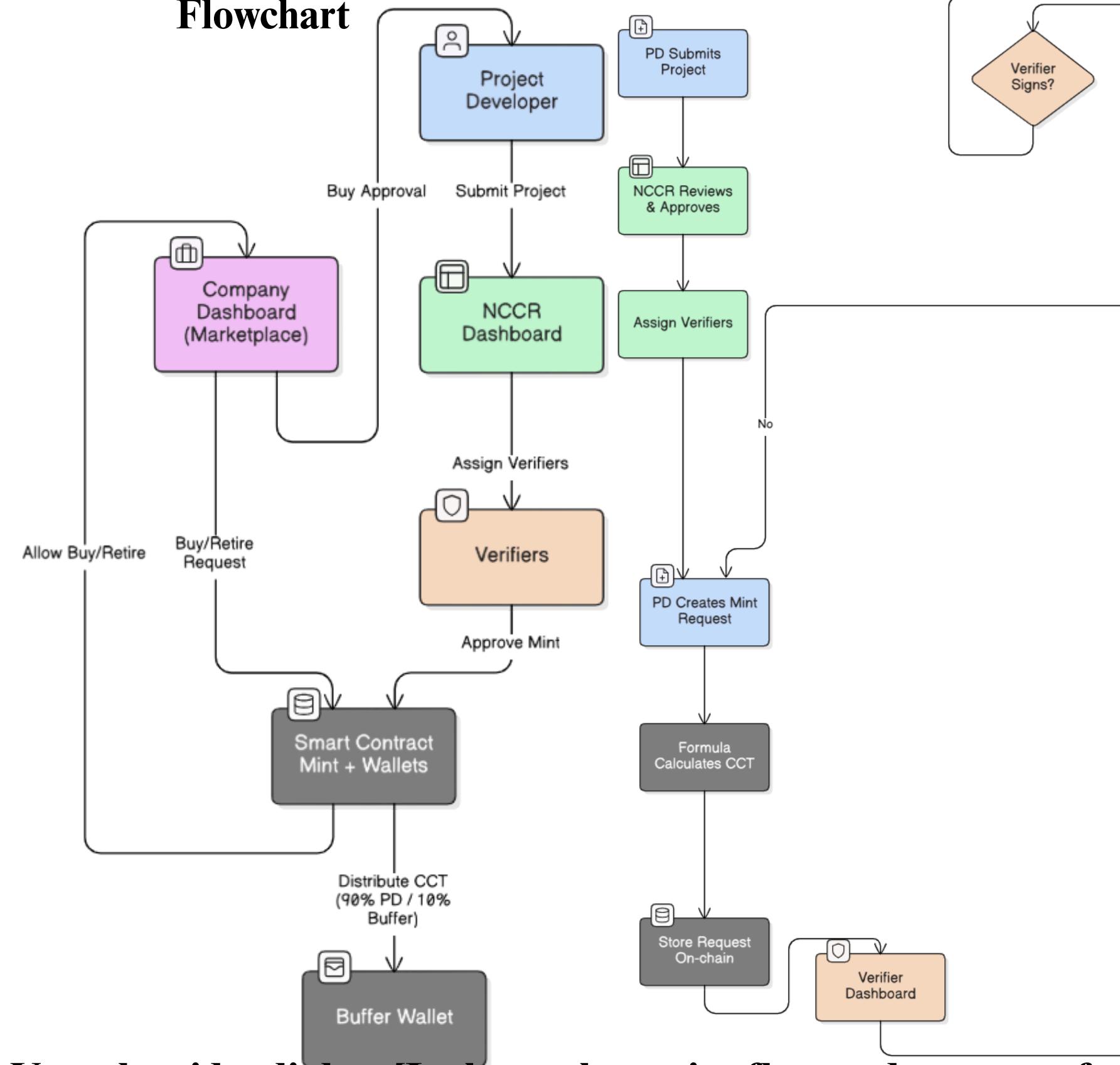
Streamlined Project Approval

Fast, automated, and secure

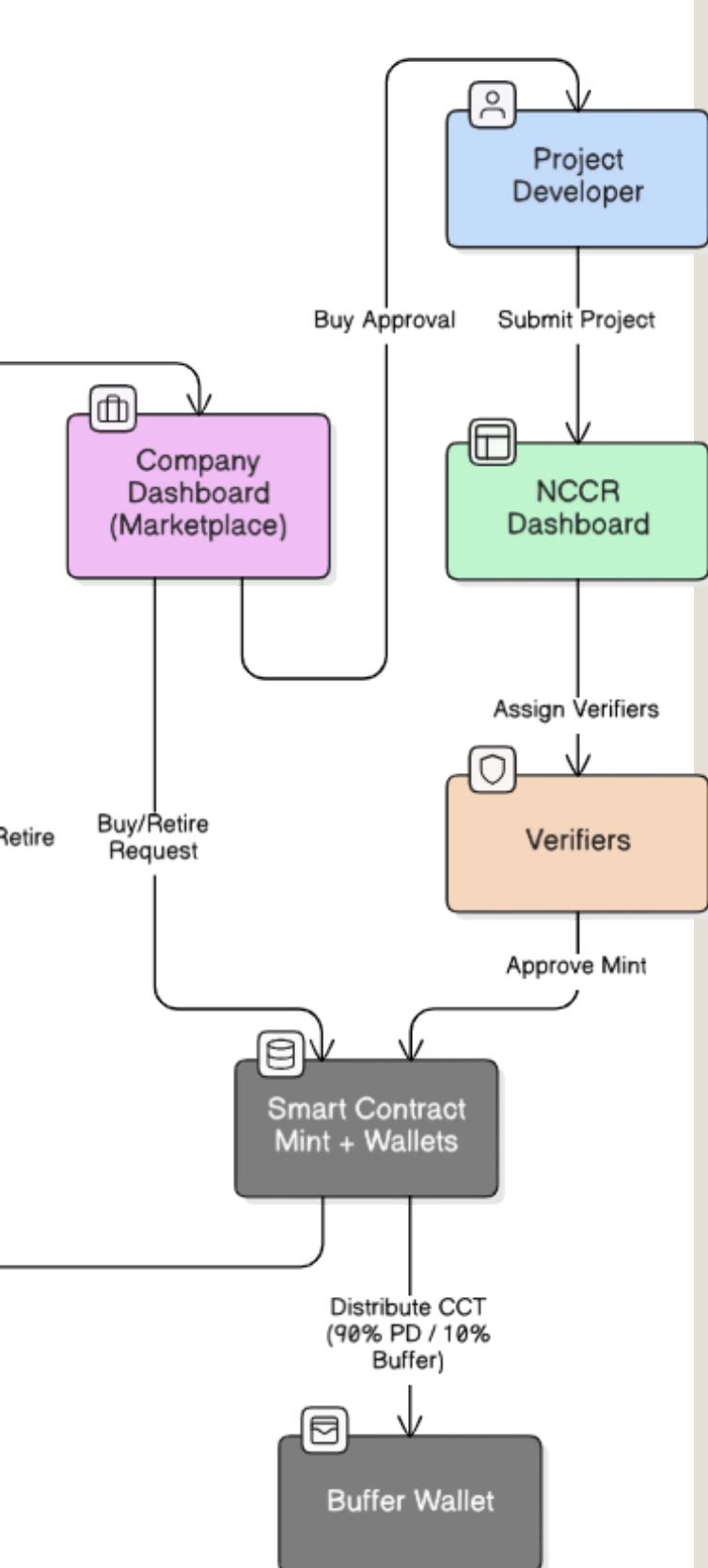
TECHNICAL APPROACH

Green ETH

High-Level Overview Flowchart



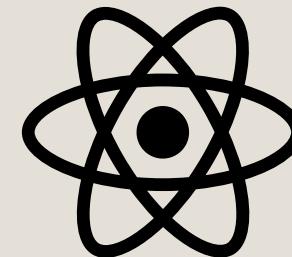
Minting Flow



Youtube video link :- [It shows the entire flow and process of our application/prototype.]
<https://www.youtube.com/watch?v=AEiGvYPUi84>

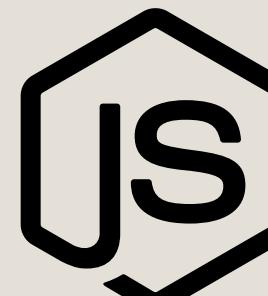
Tech Stack

- Frontend:



TailwindCSS

- Backend -



ex

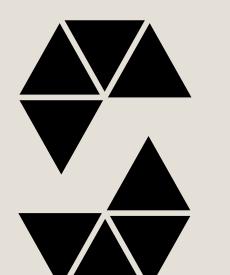
Express.js

- Blockchain-



OpenZeppelin

100

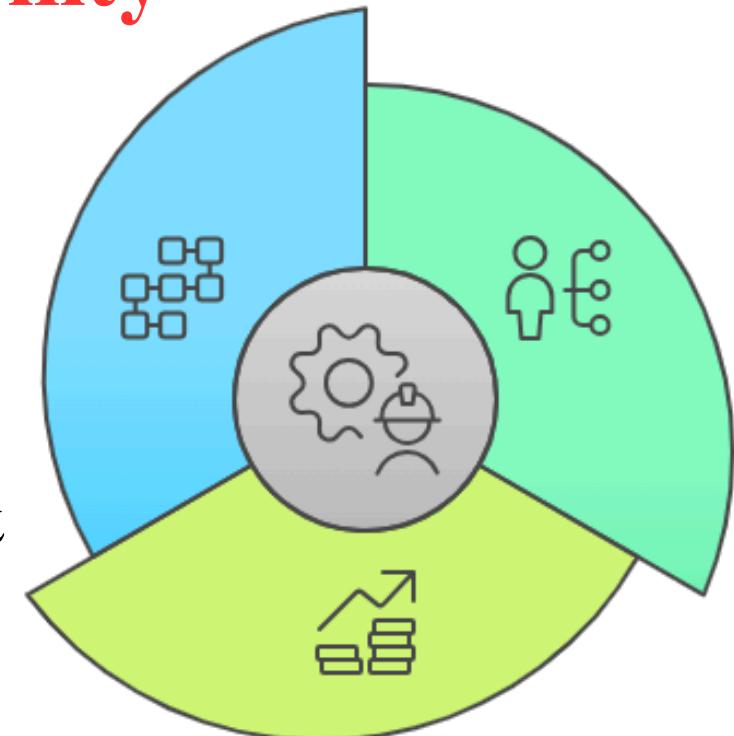


Solidity

FEASIBILITY & VIABILITY

Technical Feasibility

- ERC-20 + IPFS: Secure & decentralized
- MetaMask + Hybrid: Scalable & user-controlled



Financial Feasibility

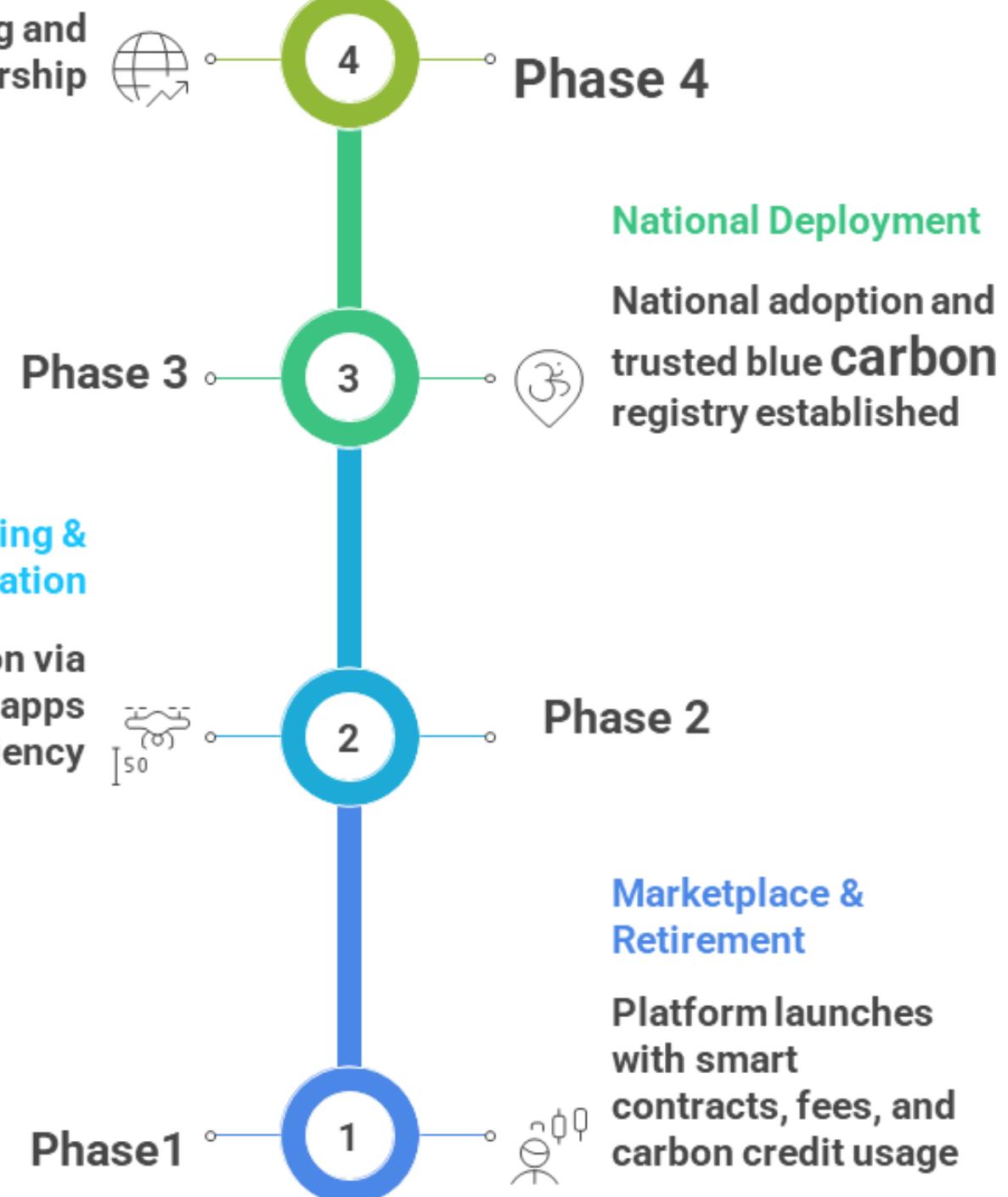
- Low cost: One-time build, minimal ops
- Revenue: Small fee, high demand

Operational Feasibility

- Clear roles: Developers, Verifiers, NCCR.
- Hybrid model: Oversight + Transparency

International Expansion

Global integration enables cross-border trading and leadership



IMPACT AND BENEFITS

ENVIRONMENT

Supports scaling up the conservation and restoration of mangroves, seagrasses, and salt marshes.

SOCIAL

Empowers indigenous and coastal communities with ownership and control over ecosystem services.

ECONOMIC

Unlocks new revenue streams through high-integrity carbon credits.

Attracts impact investment and green finance into the blue economy.

TRANSPARENCY AND TRUST

Blockchain provides a public, tamper proof ledger which ensures authenticity and transparency of each transaction.

IMPROVED MRV EFFICIENCY

Automates data collection, verification, and reporting using smart contracts.

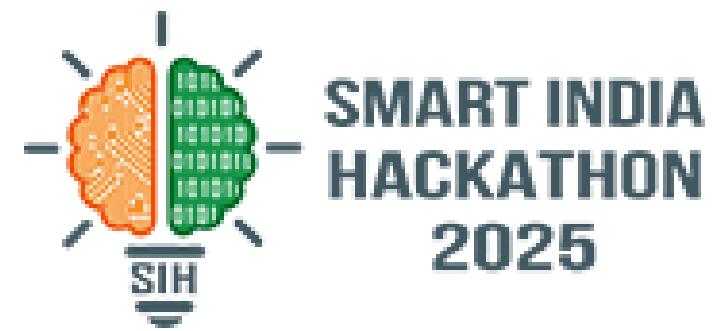
GLOBAL STANDARDIZATION

Ensures transparent, secure, and globally standardised monitoring, reporting, and verification of marine and coastal carbon assets

ENHANCED ACCOUNTABILITY

Smart contracts enforce compliance with carbon standards (e.g., Verra, Gold Standard).

RESEARCH AND REFERENCES



- Saraji, S. & Borowczak, M. (2021). A Blockchain-based Carbon Credit Ecosystem. arXiv preprint arXiv:2107.00185.
Available at: <https://arxiv.org/abs/2107.00185>
- Zhao, C., Sun, J., Gong, Y., Li, Z. & Zhou, P. (2022). Research on the Blue Carbon Trading Market System under Blockchain Technology. Energies, 15(9): 3134. DOI:10.3390/en15093134. Available at: <https://www.mdpi.com/1996-1073/15/9/3134>