SDG BLOCKCHAIN ACCELERATOR

Impact Measurement Framework – Template

Project Name:
Nozama Tech LTD- Plastiks- Verifiable Waste Recovery and Traceability System for Armenia

Challenge & UNDP Office:
Waste Traceability and EPR Readiness – UNDP Armenia Country Office

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2. SDG Alignment

SDG 12: Responsible Consumption and Production

- **Target:** 12.5 – Substantially reduce waste generation through prevention, reduction, recycling, and reuse.

- **Indicator:** 12.5.1 – National recycling rate, tons of material recycled.

- **Project Contribution:** Verified and tokenized recovery of plastic waste recorded on Cardano blockchain, with transparent data available for municipal and national reporting.

SDG 13: Climate Action

- **Target:** 13.2 – Integrate climate change measures into national policies, strategies, and planning.

- **Indicator:** 13.2.2 – Total greenhouse gas emissions per year.

- **Project Contribution:** Reduction of CO_2 emissions from landfilled plastic through verified recycling and issuance of Carbon Credits tied to recovery activities.

SDG 11: Sustainable Cities and Communities

- **Target:** 11.6 – Reduce the adverse per capita environmental impact of cities, including by paying special attention to municipal waste management.

- **Indicator:** 11.6.1 – Proportion of municipal solid waste collected and managed in controlled facilities.

- **Project Contribution:** Deployment of digital infrastructure enabling municipalities to monitor, verify, and improve waste management performance across rural communities.

3. Key Performance Indicators (KPIs)

(Define measurable indicators that show your project's impact.)

Examples:

KPI	Measurement Method	Target / Threshold	Notes
Plastic Credits (NFTs) Issued	On-chain Cardano transaction logs	50,000–100,000 NFTs in first year	Each NFT represents 1 kg of verified plastic recovery. Minted on Cardano with SDG 12 & 13 metadata.
Accredited Waste Entities	Platform backend (accreditation module)	Minimum 3 entities onboarded (Kotayk & Gegharkunik MSWM, ISSD NGO, ArmPack)r	Verified via 3-step accreditation (docs, operational proof, on-chain authorization).
Verified Waste Volume	Data uploaded by accredited entities + blockchain anchoring	100 tons of plastic recovered and verified in pilot phase	Cross-checked with physical collection logs and blockchain record
Cardano Wallets Created	Wallet creation logs (Nami, Eternl, Lace integrations)	12,000+ new wallets (citizens, collectors, producers)	Represents community and stakeholder participation.
Transactions Anchored to Cardano	Cardano explorer / on-chain analytics	250,000+ on-chain transactions	Includes token minting, accreditation events, and reward transfers.

Community Engagement	Participation records and campaign metrics	40,000 residents reached (Sevan & Hrazdan communities)	Measured via work-shops, activation Campaigns and Wallet activations.
Corporate Partners Onboarded	Signed MoUs or platform onboarding data	2+ multinational brands (e.g., PepsiCo, Coca-Cola)	Participation through Arm Pack PRO or CSR partnerships.
Reduction in Landfilled Plastic	Reports from waste operators and pilot tracking	≥10% reduction in landfill-bound plastic from pilot areas	Estimated based on verified segregation and recovery data.

4. Tracking Methods

(Describe how you will monitor and collect data for KPIs.)

On-chain Metrics:

- **Transaction success rate:** All blockchain interactions (NFT minting, wallet transactions, and accreditation anchoring) will be tracked via **Cardano CLI** and **Ogmios API** to ensure a minimum 95% transaction success rate.

- **Tokens minted/burned:** Every **Plastic Credit NFT** issued or retired will be automatically recorded on-chain. Minting data will be logged weekly and cross-checked with internal dashboards.

- **UTxO state changes:** Used to verify ownership transfers of NFTs, token redemptions, and marketplace transactions. Each verified UTxO event will be linked to accredited actors' wallet addresses.

- **Metadata validation:** NFT metadata (SDG indicators, waste volumes, GPS data) will be checked for accuracy against accreditation data prior to minting.

Off-chain Metrics:

- **Dashboard monitoring:** The Plastiks admin dashboard will record user activity, verification workflows, document uploads, and token issuance in real time. Data will be reviewed weekly by the Plastiks operations team.

- **Accreditation records:** Each waste actor's documents, photos, and validation logs will be securely stored and cross-referenced with blockchain outputs to confirm authenticity.

- **External reporting & oracles:** Data on recovered waste volumes and CO_2 avoidance will be validated through **third-party audits** or **partner verification (UNDP Armenia, ISSD NGO)** on a quarterly basis.

- **Surveys & stakeholder feedback:** Regular feedback from municipal operators, NGOs, and citizens will be collected through online surveys and field visits to measure usability, trust, and impact perception.

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Example:

All Plastic Credit NFTs minted on Cardano will be logged through **Ogmios** and cross-checked weekly against Plastiks' internal dashboard. Verified recovery data will be aggregated monthly, while CO_2 avoidance and ESG reporting summaries will be submitted to UNDP Armenia every quarter.

5. Baseline vs Projected Outcomes

Metric	Baseline	Projected Outcome (12 months)
Plastic Credits (NFTs) Minted	0	50,000–100,000 Plastic Credits issued on Cardano, each representing 1 kg of verified recovered plastic

Accredited Waste Actors	0	3 accredited entities (Kotayk & Gegharkunik MSWM, ISSD NGO, ArmPack Foundation) onboarded and verified
Verified Plastic Recovered	0 tons	100 tons of segregated and verified plastic recorded on-chain
Cardano Wallets Created	0	12,000+ wallets activated (waste actors, collectors, citizens, producers)
On-chain Transactions	0	250,000+ blockchain transactions (NFT issuance, verification, and marketplace interactions)
Community Reach	Limited waste segregation awareness	40,000 residents in Sevan and Hrazdan engaged through awareness and digital incentive programs
Corporate Partners Engaged	0	2–3 multinational brands (e.g., PepsiCo, Coca-Cola, Pernod Ricard) participating through ArmPack or CSR sponsorships
CO_2 Emissions Avoided	0	~150 tons CO_2 avoided through verified recycling activities
Transaction Success Rate	N/A	≥95% success rate for all Cardano on-chain interactions
Stakeholder Trust Score	N/A	≥85% satisfaction among local partners and UNDP Armenia

6. Monitoring & Reporting Plan

The project will follow a structured monitoring and reporting plan to ensure transparency, accountability, and data integrity throughout implementation.

Frequency:
 Reporting will be conducted on a **quarterly basis** to UNDP Armenia, Emurgo, and other relevant partners. **Monthly internal reviews** will complement this process to assess technical performance, accuracy of verified data, and user engagement within the accredited network.

Responsible Parties:
Overall leadership and coordination will be managed by **André Vanyi-Robin (Founder & CEO, Plastiks)**, who will oversee strategic alignment, partner coordination, and ensure that all project outcomes meet both UNDP and Cardano ecosystem standards.
Ana Aguilar Meca (COO, Plastiks) will support André in coordinating milestone delivery, resource allocation, and compliance reporting to UNDP Armenia.
 Trym Lyngset (Chief Product Officer) will lead the product and platform performance review, ensuring that all technical developments, user interfaces, and dashboards meet the specifications required for pilot validation.
 Delfina Achinelly (Head of Methodology & Verification) will oversee accreditation and verification protocols, ensuring methodological accuracy, data traceability, and proper integration of SDG indicators into verification outputs.
 Estefania Brito (Quality and Admin Controller) will handle documentation control, verification trail consistency, and the compilation of reports to ensure they meet quality management and ISO standards.

Format:
Quarterly reports will include a combination of **on-chain data logs**, **dashboard analytics**, and **narrative PDF summaries** for institutional partners. Blockchain data will be verified using **Cardano Explorer**, **Ogmios**, and **Kupo**, while off-chain metrics will be collected through the **Plastiks verification dashboard**. An **annual impact summary and video presentation** will be shared with UNDP Armenia and Emurgo, highlighting environmental, social, and policy results.

Tools:
 Monitoring activities will use a mix of blockchain-native and data management tools:

- **Cardano Explorer, Ogmios, and Kupo** for on-chain validation and tracking of token issuance and transactions.

- **Plastiks app dashboard** for off-chain verification, accreditation progress, and waste recovery metrics.

- **GDPR-compliant cloud storage** for archiving evidence and reports.

- **Google Data Studio** and **Power BI** for visual analytics and stakeholder presentations.

7. Risks & Mitigation

(Optional: outline potential risks in measuring impact and how you will address them.)

The project acknowledges several potential risks related to data accuracy, technical reliability, and user adoption, along with mitigation strategies to ensure robust delivery.

- A key risk is **data inconsistency between on-chain and off-chain records,** which could affect transparency and stakeholder confidence. To mitigate this, the team will run weekly reconciliation scripts to cross-check blockchain logs with dashboard data and perform manual verification audits.
- Another challenge relates to **limited digital literacy among rural users,** which may slow adoption of the accreditation process. To address this, Plastiks will simplify the user interface, integrate clear visual cues, and **deliver training and onboarding sessions in Armenian** for local operators.
- Potential **delays in data feed updates could impact reporting timelines**.
- Given the connectivity challenges in rural Armenia, **internet instability** could delay evidence uploads. The app will therefore include offline-first functionality, allowing data to be stored locally and synchronized automatically once connectivity is restored.
- The team also recognizes that changes in the **EPR regulatory timeline** could affect the institutional deployment pace. Continuous coordination with the Ministry of Environment and UNDP Armenia will ensure the platform's readiness aligns with national implementation schedules.
- Finally, there is a technical risk o**f bugs or downtime in smart contract deployment.** To prevent this, all code will be tested extensively on **Cardano testnet before mainnet releas**e, with a rollback protocol and quality assurance procedures in place.