FIBER

FRAMEWORK FOR INCOME BIODIVERSITY & EMISSION REDUCTION

TECHNICAL GUIDANCE FOR PROJECT DEVELOPERS & VALIDATION AND VERIFICATION BODIES (VVBs)

Quantification of Upstream Polymeric Source Reduction through Serialized Jute Material Displacement and Lifecycle Displacements (JPAC Framework).

METHODOLOGY CODE:	TJF-METH-0002 (Version 1.1)
ASSET CLASS:	Jute Plastic Avoidance Credits (JPACs)
PRIMARY SCOPE:	Upstream Source Reduction & Polymeric Material Displacement
SECONDARY SCOPE:	Sectoral Scope 1 (Agriculture & Supply Chain Safeguards)
ELIGIBLE POLYMERS:	HDPE, LDPE, LLDPE, PP (Polypropylene)

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1. CHAPTER-SPECIFIC GUIDANCE FOR VALIDATION AND VERIFICATION BODIES (VVBs)

1.1 Baseline Establishment and Data Authenticity Standards

Project developers are strictly prohibited from utilizing generalized national statistics or regional assumptions to justify the baseline plastic consumption of a project activity.

- **The 24-Month Rule:** The project developer must extract, compile, and present consecutive, audited 24-month historical procurement records directly from the corporate buyers or target entities participating in the material substitution program.
- **Material Evidence Trail:** This trailing baseline dataset must consist of verified purchase invoices, accounting ledgers, and shipping manifests that explicitly name the manufacturer, polymer type, thickness, and total unit quantity of the plastic packaging historically consumed.
- **Data Sufficiency:** In the event that a target user possesses fewer than 24 months of verified data due to recent incorporation, the developer may request a custom administrative variance from the registry, subject to an automatic 15% conservative discount applied across the entire baseline period.

1.2. Moisture Calibration Protocol (The Dry-Basis Standard under ISO 287)

Because natural jute fibers are highly hygroscopic, raw bulk weight fluctuates significantly based on ambient relative humidity during transit and storage. To completely block weight-inflation fraud (crediting water instead of fiber infrastructure), developers must adhere to the following data normalization protocol:

- **Mandatory Testing:** The developer must utilize digital pin/insertion moisture meters calibrated to national metrology standards to test every commercial batch prior to final warehouse dispatch.
- **The 14% Regain Normalization:** All physical mass logs recorded by truck or warehouse scales must be mathematically adjusted down to a standard 14% commercial moisture regain baseline under **ISO 287** using the following formula: $\text{Normalized\ Dry\ Mass\ }(M_{\text{dry}})=\text{Raw\ Scale\ Mass}\times \left(\frac{100}{100+\text{Measured\ Moisture\ Percentage}}\right)\times 1.14$
- **Enforcement:** This calculated dry-basis normalized mass is the only value permitted to enter the registry database. Raw, unadjusted scale tickets shall be flagged as an automatic non-conformance.

1.3. Managing Statistical Survey Uncertainty and Confidence Pools

When deploying annual field surveys to calibrate the active Jute Reuse Factor (T_{jute}) or localized Displacement Factors (DF), developers must design their data collection campaigns to satisfy rigorous statistical metrics:

- **Confidence Targets:** Survey sampling pools must be randomized, independent, and sized dynamically using standard Cochran formulas to achieve a minimum **95% confidence interval with a maximum 5% margin of error** relative to the total annual distributed bag population.
- **Applying the Section 12 Matrix:** In scenarios where extreme geographic fragmentation or security constraints prevent field teams from hitting the 5% precision target, developers are permitted to utilize datasets exhibiting up to a maximum 15% error margin, provided they manually adjust their credit yield downward using the tiered penalty multipliers defined in the Section 12 Conservativeness Discount Matrix. Any dataset displaying a margin of error greater than 15% shall be discarded as invalid.

2. CHAPTER-SPECIFIC GUIDANCE FOR VALIDATION AND VERIFICATION BODIES (VVBs)

2.1 Mandatory Physical Site-Audit Sequences and Sampling Boundaries

Desktop-only validations or digital-only verifications are strictly illegal under the **TJF-METH-0002** standard. The VVB audit team **shall** execute randomized, on-site physical inspections during both the initial validation phase and every subsequent annual verification cycle.

- **Upstream Mill Inspections:** The VVB must physically visit a randomized sample of at least $\sqrt{N}$ (where N is the total number of participating spinning and weaving mills) during active production runs. The auditor must visually verify the operating state of mechanical looms and cross-examine raw jute fiber inventory manifests against factory energy usage logs to confirm manufacturing legitimacy.

- **Downstream Retail Spot-Checks:** For consumer-focused projects (Pathway B), the VVB must perform unannounced field visits to a randomized pool of participating point-of-sale retail facilities. Auditors must directly observe cash-register transactions, verify the active distribution of serialized jute alternatives, and pull live transactional receipt logs from the retailer's local server to cross-verify them against the registry's digital ledger.

2.2 Serialization Integrity and Automated Anti-Double-Counting Audits

The VVB must thoroughly stress-test the digital infrastructure of the project's tracking engine to guarantee absolute asset purity:

- **Tag Verification:** Auditors must randomly select a minimum of 500 individual jute bags from the active distribution warehouse and physically scan their embedded QR codes or RFID tags using independent hardware. The scanned serial numbers must be checked against the registry's live database to confirm that they exist within the declared batch range, display correct timestamp parameters, and are assigned to the correct project developer.

- **Duplication Testing:** The VVB must run automated cross-registry queries against competitive global voluntary ledgers (such as Verra, Gold Standard, and PCX Markets) and national compliance portals (such as the Central Pollution Control Board EPR portal in India). The auditor must confirm that the specific polymer volume and geographic footprint under review have not been double-claimed or monetized under any parallel greenhouse gas, waste management, or extended producer responsibility protocol.

2.3 Social and Environmental Safeguards Verification Checkpoints

To clear a project for credit issuance, the VVB must issue formal, audited sign-offs across three critical human and environmental safeguards:

- **The Factory Safety Audit:** The VVB must inspect the mill floor to verify that all workers operating in high-noise, high-lint mechanical loom areas are actively provided with and wearing organic dust respirators and industrial ear protection. The auditor must cross-verify factory employee payroll records to confirm that all wages meet or exceed the benchmarks defined by the Global Living Wage Coalition (GLWC) or the Anker Methodology for that specific production corridor, completely overriding local minimum-wage baselines if they fall below the living wage line.

- **Upstream Retting Inspections:** The VVB must audit independent laboratory test report sheets for all regional agricultural retting zones. The auditor must verify that semi-annual water sampling occurred 50 meters upstream and downstream of the retting sites, and confirm that the biological waste discharge did not cause an active Biochemical Oxygen Demand (BOD) spike greater than 10% or depress local Dissolved Oxygen levels below **4.0 mg/L**.

- **The Waste Picker Livelihood Audit:** For all urban retail projects, the VVB must independently review the developer's mandatory Livelihood Impact Assessment. The auditor must perform localized focus groups with the informal waste-picking community within the project boundary to verify that the upstream plastic source reduction has not destabilized their daily sorting subsistence income without triggering the registry's mandatory Just Transition employment mitigation strategy.

2.3 Multi-Asset Claims & Double-Counting Safeguards

2.3.1 Objective

To ensure the environmental integrity of Upstream Plastic Avoidance Credits (UPACs) by verifying that overlapping environmental attributes (specifically carbon sequestration) are not double-claimed or double-counted across different environmental asset registries.

2.3 2 VVB Verification Protocol

When auditing a project under this pathway, the VVB **must** execute the following verification steps:

- **Supply Chain Declarations:** The VVB shall review legally binding declarations from the upstream raw material suppliers (jute cultivation farms/cooperatives). The developer must disclose whether the specific cultivation land or biomass yield has successfully registered or sold carbon offsets (e.g., soil carbon sequestration, biomass credits) under any carbon standard.

- **LCA Boundary Assessment:** If an upstream carbon credit has been claimed by the farmer, the VVB must ensure that the project's Life Cycle Assessment (LCA) boundary strictly isolates the plastic substitution metric. The manufacturer **cannot** claim any "net-negative carbon footprint" or "cradle-to-gate carbon benefit" derived from agricultural growth phases.

- **Data Isolation Audit:** The VVB must verify that the raw material inputs used for calculating the plastic avoidance metric are tracked independently of the carbon accounting metrics used by the agricultural registry.

2.2.3. Acceptable Auditing Thresholds

- **Permissible:** Concurrent issuance where the farmer claims **tCO_2e** for agricultural carbon sequestration and the manufacturer claims **tonnes of plastic avoided (t)** for polymer displacement.

- **Non-Permissible (Red Flag):** The bag manufacturer marketing or adjusting their plastic credit volumes upward by factoring in the carbon credits earned upstream by the farmer.