
An ISO-Aligned Verification Framework for Community-Based Food Security in Low-Data Contexts

Vinay Chawla

Executive Director, Langar Carbon, India, Correspondence: langarcarbon@gmail.com

DOI : <https://doi.org/10.5281/zenodo.18229965>

ARTICLE DETAILS

Research Paper

Accepted: 22-12-2025

Published: 10-01-2026

Keywords:

food security, verification framework, sustainability, ISO standards, community kitchens, SDG 2, SDG 12, low-data contexts

ABSTRACT

This study presents the Langar Credit Protocol (LCP), a novel verification framework designed to assess and certify community-based food security operations in India. Aligned with ISO standards including 14064-3, 17029, and 20121, the LCP introduces a tiered classification system (Silver, Gold, Platinum) based on sustainability performance across four key operational indicators: fuel type, utensil type, sourcing type, and meal type. The protocol employs evidence triangulation and reliability weighting to verify meal counts and sustainability claims in low-data environments (ISO, 2019a; ISO/IEC, 2019). Through the issuance of Langar Credits (LC), each representing 1,000 verified meals, the LCP provides an impact assurance asset that contributes to Sustainable Development Goals (SDGs) 2 (Zero Hunger) and 12 (Responsible Consumption and Production). This study details the protocol's design, verification procedures, quality assurance mechanisms, and potential implications for community kitchens and cafés operating in resource-constrained settings.

1. Introduction

Community kitchens and community cafes (CKCCs) play a vital role in addressing food insecurity in India, directly contributing to SDG 2.1 (zero hunger) (UN DESA, 2025a). However, the lack of standardized, credible verification mechanisms for their social and environmental impact limits their ability to attract support, demonstrate accountability, and scale operations. Existing monitoring,



reporting, and verification (MRV) frameworks are often ill-suited to the low-data, volunteer-driven contexts in which many CKCCs operate (UNDP, 2013).

This study introduces the Langar Credit Protocol (LCP), a verification framework specifically designed for community-based food security initiatives in India. The LCP aligns with internationally recognized ISO standards (ISO, 2019a; ISO/IEC, 2019; ISO, 2024) to ensure rigor, transparency, and reproducibility while remaining accessible and adaptable to the operational realities of CKCCs. The protocol quantifies impact through “Langar Credits,” certifying both meal provision and sustainability performance.

2. Literature Review

Current approaches to food security verification range from large-scale national reporting (FAO, 2025a) to certification schemes for sustainable food systems (Gold Standard Foundation, 2024b; ProTerra Foundation, 2023). However, a gap exists in community-scale, non-commercial operations that prioritize social services over profit (Sikh Research Institute, 2023). Frameworks such as ISO 20121 (event sustainability) and ISO 37101 (community sustainability) provide principles but lack procedural specificity for meal-based interventions (ISO, 2024; ISO, 2016). The LCP bridges this gap by adapting ISO 14064-3 (GHG verification) and ISO/IEC 17029 (conformity assessment) principles to the food security sector, emphasizing evidence triangulation and risk-based assurance in low-data environments (ISO, 2019a; ISO/IEC, 2019). The protocol also draws upon methodological guidance for SDG monitoring (FAO, 2021b; UNESCO Chair on Global Health, 2023) and the national policy frameworks (Ministry of Health and Family Welfare, India, 2025).

3. Methodology: The Langar Credit Protocol Framework

3.1. Scope and Eligibility

The LCP applies to CKCCs serving a minimum of 1,000 meals annually, operating on a charitable and non-discriminatory basis, and maintaining basic records. It excludes for-profit, institutional, and informal operations that are incompatible with its verification requirements or the *Seva* (service) ethos, aligning with the principles of social responsibility (ISO, 2010).

3.2. Sustainability Indicators and Scoring

Four scored indicators, each aligned with SDG 12 targets, form the basis of the sustainability score (S = 4–12 points):



1. Fuel Type (SDG 12.2)
2. Utensil Type (SDG 12.5)
3. Sourcing Type (SDG 12.7)
4. Meal Type (SDG 12.2)

Each indicator is categorized as A (exemplary, 3 pts), B (transitional, 2 pts), or C (foundational, 1 pt), based on $\geq 70\%$ majority practice.

3.3. Tier Classification

The sustainability score determines the performance tiers as follows:

- Silver: 4–6 points (foundational)
- Gold: 7–9 points (established)
- Platinum: 10–12 points (exemplary)

3.4. Verification and Evidence Requirements

Verification follows a four-stage cycle (Preparation, Assessment, Reporting, Issuance) conducted by certified Langar Seva Verifiers (LSVs). Evidence is triangulated from at least three independent sources (e.g., documents, interviews, observations) with a minimum reliability weight of 2.1. This approach is informed by validation and verification principles (ISO, 2019a; ISO, 2020) and statistical reliability (McHugh, 2012).

3.5. Langar Credit Calculation

Langar Credits (LC) are issued post-verification using the following formula:

$$LC = \text{floor}[(VM + 500) / 1000]$$

where VM = verified meals ($\pm 5\%$ materiality).

4. Results and Discussion

4.1. Operationalizing Verification in Low-Data Contexts



The LCP's evidence triangulation method and reliability weighting system enable robust verification despite limited record-keeping, a challenge noted in low-data MRV contexts (UNDP, 2013). The allowance for testimonial evidence (weight = 0.7) acknowledges oral cultures and volunteer-based operations, whereas the ≥ 2.1 threshold ensures evidentiary rigor, consistent with ISO 14065 requirements for verification bodies (ISO, 2020).

4.2. Tier System as a Performance Incentive

The tier framework provides clear benchmarks for improvement, encouraging CKCCs to transition toward cleaner fuels, reusable utensils, local sourcing, and plant-based meals, which are key aspects of sustainable food systems (FAO, 2020b; ISO 22000, 2018). The cultural exemption for fuel use in traditional cooking (up to 30% Category C) balances sustainability goals with cultural practices, reflecting a community-centered approach advocated in sustainability management systems (ISO, 2016).

4.3. Capacity Building through Training and Calibration

LSVs undergo a structured 6-hour training and must achieve $\geq 85\%$ on a certification exam. Annual calibration via benchmark cases ($\kappa \geq 0.80$) maintains inter-rater reliability and protocol integrity (McHugh, 2012), which is a critical component of credible conformity assessment (ISO/IEC, 2019).

4.4. Quality Assurance and Continuous Improvement

The Registry conducts desk reviews, random field re-audits (5% of cases), and implements corrective actions based on the severity of discrepancies. This quality assurance framework aligns with the ISO/IEC 17029 requirements (ISO/IEC, 2019) and supports continuous improvement, a core principle of sustainability management (ISO, 2024).

5. Conclusion

The Langar Credit Protocol offers a credible, scalable, and context-sensitive verification framework for community-based food security in India. By aligning with ISO standards and incorporating flexibility for low-data operations, the LCP enhances the transparency, accountability, and impact visibility of CKCCs, thereby supporting national and global food security agendas (Ministry of Health and Family Welfare, India, 2025; UN DESA, 2025c). Future research should focus on pilot implementation data, longitudinal impact assessments, and the adaptation of the framework to other regions and community-based service models.



6. References

- FAO. (2020a). *Rethinking our food systems: A guide for multi-stakeholder collaboration*. Food and Agriculture Organization.
- FAO. (2020b). *Sustainable food systems: Concept and framework*. Food and Agriculture Organization.
- FAO. (2021a). *Food loss and waste measurement methodology: Executive summary*. Food and Agriculture Organization.
- FAO. (2021b). *Methodology for Monitoring SDG Target 12.3*. Food and Agriculture Organization.
- FAO. (2025a). *The state of food security and nutrition in the world 2025*. Food and Agriculture Organization.
- FAO. (2025b). *Tracking progress on food and agriculture-related SDG indicators 2025*. Food and Agriculture Organization.
- Gold Standard Foundation. (2024b). *Validation and verification standard V1.0. Gold Standard for the Global Goals*. .
- ISO. (2010). *ISO 26000:2010 Guidance on social responsibility*. International Organization for Standardization.
- ISO. (2016). *ISO 37101:2016 Sustainable development in communities , Management system for sustainable development , Requirements with guidance for use*. International Organization for Standardization.
- ISO. (2018). *ISO 22000:2018 Food safety management systems , Requirements for any organization in the food chain*. International Organization for Standardization.
- ISO. (2019a). *ISO 14064-3:2019 Greenhouse gases , Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions*. International Organization for Standardization.



- ISO. (2020). *ISO 14065:2020 General principles and requirements for bodies validating and verifying environmental information*. International Organization for Standardization.
- ISO. (2024). *ISO 20121:2024 Event sustainability management systems , Requirements with guidance for use*. International Organization for Standardization.
- ISO/IEC. (2019). *ISO/IEC 17029:2019 Conformity assessment , General principles and requirements for validation and verification bodies*. International Organization for Standardization.
- McHugh, M. L. (2012). Interrater reliability: The kappa statistic. *Biochemia Medica*, 22(3), 276–282.
- Ministry of Health and Family Welfare, India. (2025). *National action plan on food security and climate change*. New Delhi: Government of India.
- ProTerra Foundation. (2023). *ProTerra monitoring and verification standard v1.0*.
- Sikh Research Institute. (2023). *Food security: A sustainable way forward, A case study of the Sikh Langar*.
- UN DESA. (2025a). *The Sustainable Development Extended Report 2025: Goal 2*. United Nations Department of Economic and Social Affairs.
- UN DESA. (2025b). *The Sustainable Development Extended Report 2025: Goal 12*. United Nations Department of Economic and Social Affairs.
- UN DESA. (2025c). *The Sustainable Development Goals Report 2025*. United Nations Department of Economic and Social Affairs.
- UNDP. (2013). *Measurement, reporting and verification (MRV) technical paper: Building from a low data and knowledge base*. United Nations Development Programme.
- UNESCO Chair on Global Health. (2023). *Food security, food systems and community-based actions*.