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Strengthening Sustainable Halal Assurance through Education and SOP Development for Loloh Cemcem MSMEs in Penglipuran Village, Bali

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Abstract.
Halal certification requires continuous operational control to remain credible, yet many traditional food and beverage micro, small, and medium enterprises (MSMEs) rely on tacit routines rather than written procedures. This community service program strengthened post-certification halal assurance among Loloh Cemcem producers in Penglipuran Village, Bali. A participatory approach was implemented through five stages: preliminary observation, halal education, joint identification of halal critical points, development of a practical halal standard operating procedure (SOP), and qualitative evaluation. Observation and discussion indicated stronger participant awareness of ingredient verification, equipment sanitation, cross-contamination prevention, hygienic packaging, storage, and documentation. The jointly developed SOP translated these concerns into simple daily controls covering raw materials, cleaning, processing, packaging, storage, and record keeping. Because no standardized pre-test or post-test was used, the outcomes should be interpreted as observed changes in understanding and commitment rather than measured causal effects. The program shows how post-certification mentoring can connect halal integrity, food safety, and operational consistency in a traditional beverage MSME context. It also supports SDGs 3, 8, 11, and 12 by promoting safe production, local enterprise capacity, culinary heritage, and responsible production..
Keywords: *Community empowerment; Halal assurance; Loloh Cemcem; MSMEs; Standard operating procedure; SDGs*

I. INTRODUCTION

Halal certification is not a one-time administrative outcome; its credibility depends on consistent control of ingredients, facilities, processing, handling, and documentation. For food-manufacturing SMEs, deeper implementation of halal standards is associated with stronger operational performance, while internal motivation and organizational commitment are important drivers of implementation (Giyanti, Indrasari, Sutopo, & Liquiddanu, 2021). Indonesian evidence also shows that government support, religiosity, and expected business

benefits shape SMEs' intention to adopt halal practices (Silalahi, Fachrurazi, & Fahham, 2022). These findings shift attention from obtaining a certificate to embedding halal requirements in everyday operations.

This operational focus is particularly important for traditional food and beverage producers. Small enterprises often depend on inherited knowledge, shared equipment, changing suppliers, and informal records. Such conditions can create inconsistency even when the recipe appears simple. Food safety research in Indonesia further shows that knowledge and attitudes do not automatically translate into practice, which supports the need for regular training accompanied by observable procedures and controls (Putri & Susanna, 2021). A concise SOP can therefore bridge knowledge and behavior by specifying what must be checked, by whom, and when.

Penglipuran Village, Bali, is known for cultural and environmental preservation and for Loloh Cemcem, a herbal beverage made primarily from cemcem leaves (Spondias pinnata), water, sugar, salt, and chili. Its role as a local product within a tourism village makes product consistency relevant to both community livelihoods and destination trust. Research on halal tourism in Indonesia emphasizes the contribution of destination management, supporting services, perceived value, and trust to destination competitiveness (Lestari, Saidah, & Aliya Putri, 2023). For a village product, maintaining halal and hygienic production can therefore support both consumer assurance and the credibility of the local tourism experience.

The partner group had obtained halal certification collectively, but preliminary discussions indicated that daily production still relied largely on routine practice and lacked a written halal-focused SOP. Most community programs concentrate on certification assistance, leaving a practical post-certification gap. This program addressed that gap through education, critical-point identification, and collaborative SOP development. It aimed to describe a replicable, low-complexity model for strengthening sustainable halal assurance among traditional beverage MSMEs.

II. METHODS

The program was conducted with a group of Loloh Cemcem MSMEs in Penglipuran Village, Bangli Regency, Bali. It used a participatory community empowerment approach in which producers contributed their production knowledge and jointly assessed feasible improvements. The approach was appropriate because the objective was not to replace local practice, but to formalize essential controls in language and steps that producers could apply.

Five sequential stages were implemented. Data for the qualitative evaluation were obtained from field observation, informal discussion, participant responses during the educational session, and review of the jointly developed SOP. The evaluation focused on demonstrated understanding, identification of risks, engagement, and stated commitment. No standardized knowledge test, compliance audit score, or longitudinal performance measure was used.

The qualitative and participatory evaluation was selected to capture context-specific changes that could be observed during a short community engagement program, including how producers interpreted halal requirements, recognized operational risks, and assessed the feasibility of the proposed SOP. Combining observations, informal discussions, participant responses, and document review provided complementary evidence and reduced reliance on a single source of information.

This approach is consistent with participatory research, which positions community members as active contributors to problem identification, knowledge development, and the formulation of contextually appropriate solutions (Duea, Zimmerman, Vaughn, Dias, & Harris, 2022). Nevertheless, the findings represent process-level outcomes and participants' immediate responses; they should not be interpreted as evidence of long-term behavioral change or sustained compliance.

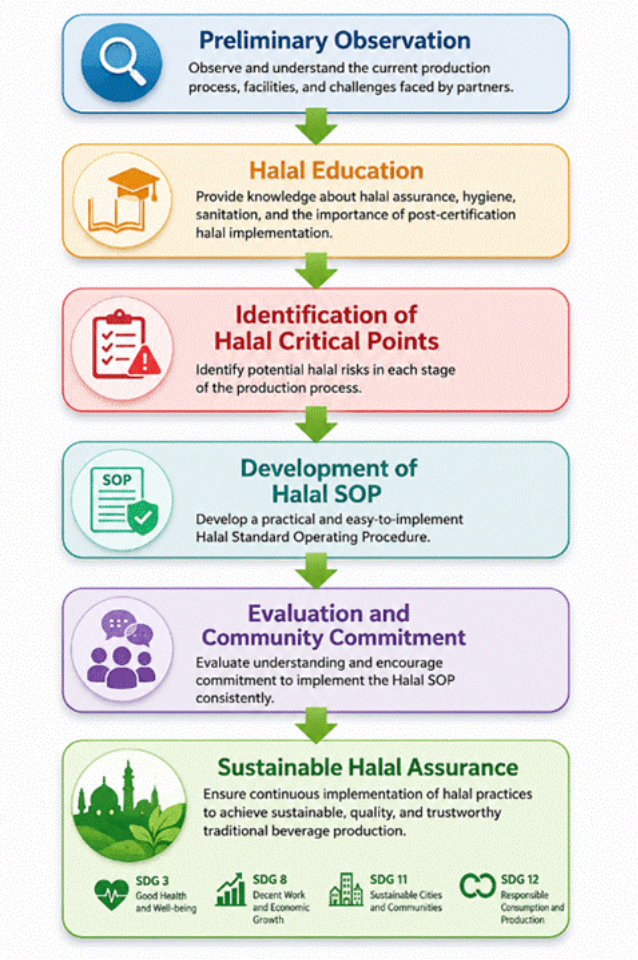


Figure 1. Participatory framework for sustainable halal assurance

Table 1 summarizes the five sequential stages of the community service program and the immediate output generated at each stage. The process began with observation to map existing production practices and identify priority issues. Halal education then established a shared understanding of halal–tayyib principles and producers' post-certification responsibilities. Building on this understanding, the producers and service team jointly examined the production process to identify halal critical points and appropriate preventive controls. These agreed controls were subsequently translated into a simple and practical SOP for daily Loloh Cemcem production. Finally, the evaluation stage assessed participants' understanding, the feasibility of the SOP, and their commitment to its implementation. Together, these stages formed a continuous pathway from identifying partner needs to establishing practical measures for sustainable halal assurance.

Table 1. Participatory framework

Stage	Core activity	Immediate output
1. Observation	Review ingredients, equipment, processing, packaging, storage, and sanitation; discuss partner needs.	Baseline production map and priority issues.
2. Halal education	Interactive presentation and discussion on halal–tayyib, hygiene, sanitation, ingredient control, and cross-contamination.	Shared understanding of post-certification responsibilities.
3. Critical-point identification	Jointly examine each production stage and identify risks and preventive controls.	List of halal critical points and controls.
4. SOP development	Translate agreed controls into simple procedures for daily use.	Practical halal SOP for Loloh Cemcem.
5. Evaluation	Observe engagement and discuss understanding, feasibility, and commitment.	Qualitative evidence of learning and an implementation commitment.

III. RESULT AND DISCUSSION

3.1 Partner context and initial need

Loloh Cemcem is produced as an affordable village beverage and sold to residents and visitors. The partner group had already achieved collective halal certification, demonstrating initial commitment to halal compliance. However, observation and discussion showed that production knowledge remained mostly tacit. The absence of a written halal-focused procedure made consistency dependent on individual habit, especially when suppliers, handlers, or production conditions changed. The central need was therefore not a new certificate, but a simple internal control mechanism that could preserve the integrity of the certified process.

3.2 Halal education as post-certification reinforcement

The educational session reframed certification as the beginning of continuous assurance. Discussion linked the halal–tayyib concept to concrete actions: verifying ingredients, using clean water and equipment, separating products appropriately, preventing cross-contamination, maintaining hygienic handling, and recording essential activities. Participants were able to relate these principles to their own workflow and identify practices requiring closer attention.



Figure 2. Discussion for sustainable halal assurance

This emphasis is supported by recent evidence. Indonesian SMEs generally accept halal certification, but knowledge and information remain weaker dimensions of policy acceptance (Darmalaksana, 2023). Training alone, however, should not be treated as proof of behavioral change. Putri and Susanna (2021) found that knowledge and attitudes may not directly predict food-handling practice. Accordingly, the program paired education with a written SOP and observable controls rather than relying only on awareness.

3.3 Halal critical points and preventive controls

The joint review identified six practical control areas. Although the ingredients are relatively simple, halal integrity can be affected by supplier changes, unverified additives, equipment cleanliness, handling, packaging, and storage. The discussion also positioned traceability as a basic managerial practice: producers should be able to identify what ingredients were used and how cleaning and production were performed. At a broader supply-chain level, traceability strengthens transparency and accountability in halal assurance (Alamsyah, Hakim, & Hendayani, 2022); for microenterprises, proportionate paper-based records are a feasible starting point.

Production stage	Main risk	Agreed preventive control
Raw-material procurement	Supplier or ingredient changes; uncertain halal status.	Use verified ingredients and trusted suppliers; re-check any change.
Washing and preparation	Unsafe water or unclean utensils.	Use clean water; clean and inspect utensils before use.
Blending and mixing	Residue or cross-contamination; unverified additives.	Clean equipment before and after production; verify all additions.

Packaging	Contamination from hands, surfaces, or packaging.	Use clean food-grade packaging and maintain a hygienic area.
Storage	Mixing with other products or unsuitable conditions.	Separate finished product and maintain clean storage.
Documentation	No evidence of ingredient or cleaning control.	Record key purchases, production, and cleaning activities simply.

3.4 SOP development and empowerment outcomes

The resulting SOP consolidated raw-material selection, equipment sanitation, ingredient preparation, processing, packaging, storage, and documentation into a concise daily guide. Simple wording was prioritized so that every producer could apply it. This converted tacit knowledge into a shared routine and created a reference for onboarding new members, checking deviations, and discussing improvements.

The qualitative evaluation indicated three immediate outcomes: clearer understanding that halal assurance continues after certification; improved ability to identify risks and preventive actions; and availability of a written operational guide. These outcomes are consistent with research showing that the depth of halal-standard implementation improves SME operational performance (Giyanti et al., 2021) and that halal certification is positively associated with operational and financial performance across Indonesian MSMEs (Nur Azizah et al., 2025). The present program does not test performance effects, but it provides an operational foundation through which such benefits may emerge.

Before the program	Observed immediate outcome
Certification had been obtained, but post-certification duties were not fully articulated.	Participants described halal assurance as a continuous production responsibility.
Critical points were not mapped explicitly.	Participants identified ingredient, sanitation, handling, packaging, and storage risks.
Production relied primarily on routine and inherited practice.	A concise written halal SOP was available for shared use.
Documentation was limited.	Simple recording was included as part of the SOP.

3.5 Sustainability contribution and limitations

The program links halal assurance with four sustainability dimensions. Hygiene and safe handling support SDG 3; stronger operational capacity supports SDG 8; maintaining Loloh Cemcem as a trusted village product supports SDG 11; and standardized, documented production supports SDG 12.

IV. CONCLUSION

Post-certification halal assurance among traditional beverage MSMEs can be strengthened through a simple participatory sequence: observe the existing process, provide focused education, identify halal critical points, translate controls into an SOP, and evaluate feasibility and commitment. In the Loloh Cemcem partner group, this process produced clearer awareness of continuous halal responsibilities, a shared map of practical risks, and a concise written SOP covering ingredients, sanitation, processing, packaging, storage, and documentation.

The principal contribution is practical rather than causal: the program demonstrates how universities can help convert halal certification requirements and local production knowledge into workable daily controls. This contribution is aligned with the Sustainable Development Goals by promoting hygienic and safe food production under SDG 3 (Good Health and Well-being), strengthening the operational capacity and competitiveness of local MSMEs under SDG 8 (Decent Work and Economic Growth), preserving Loloh Cemcem as part of the village's culinary heritage under SDG 11 (Sustainable Cities and Communities), and encouraging standardized, traceable, and responsible production practices under SDG 12 (Responsible Consumption and Production). Continued mentoring and measurable follow-up are needed to determine whether the SOP is consistently implemented and whether it improves halal compliance, product quality, business performance, and the program's longer-term contribution to these SDGs.

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