



## **ENABLING MARKET UPGRADING OF TEMPEH MSMEs: A SOFT SYSTEMS METHODOLOGY STUDY OF GMP, HACCP, AND HALAL CERTIFICATION IN JAKARTA**

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**Abstract:** This study examines the role of GMP, HACCP, and Halal certification in enabling market upgrading for tempeh and tofu micro, small, and medium enterprises (MSMEs) in Jakarta, particularly in their transition from informal sales channels to modern retail markets. Soft Systems Methodology (SSM) was employed to analyze the complex socio-technical challenges involved. Data were collected through in-depth interviews with tempeh and tofu cart vendors and focus group discussions (FGDs). Findings indicate that certification enhances product credibility and facilitates access to modern markets but is insufficient for full integration. MSMEs continue to face operational constraints, including limited packaging capacity, logistical inefficiencies, weak bargaining power, and difficulties negotiating with retailers. The SSM analysis highlights that effective market upgrading requires changes in entrepreneurial mindsets, improvements in internal processes, and stronger collaboration among MSMEs, government agencies, and market actors. This study contributes by integrating SSM with food safety and Halal certification frameworks to explain MSME market upgrading as a socio-technical process. Practically, it offers guidance for MSMEs and policymakers and supports including certified tempeh and tofu in public nutrition programs to promote a sustainable and inclusive local food system.

**Keywords:** Tempeh Production; GMP and HACCP; Halal food systems; soft systems methodology; MSME upgrading.

## INTRODUCTION

Tofu and tempeh, traditional Indonesian food products, were once served at large social events such as walimah and traditional celebrations in rural areas of Central Java and Yogyakarta. These events are ceremonies of gratitude for the cycle of life, with tempeh as a blessed offering in accordance with local beliefs (Shurtleff, 2022) It is an affordable source of protein and a symbol of food security in many countries. However, the perception of tempeh as a “low-class” commodity and the lack of innovation limit its market potential and consumer base. Strategic marketing approaches (Aprilia et al., 2023) and organizational work culture S. Wahyuningsih, (2021) are required to support transformation through the implementation of GMP (FAO, 2021), HACCP, HALAL Certification to enhance food safety standards and enable aligned marketing innovations (Kusuma Devi et al., 2024). This integration contributes to achieving several global Sustainable Development Goals (SDGs), including zero hunger (SDG 2), inclusive economic growth (SDG 8), responsible consumption and production (SDG 12), and climate action (SDG 13) (Irhamsyah, 2019). The implementation of GMP and HACCP ensures that products are safe, hygienic, and nutritious, particularly for vulnerable populations.



Fig 1: Tempeh and Tofu Production Process Before Implementing GMP and HACCP



Fig.2 Tempeh and Tofu Production Process after Implementing GMP and HACCP

Traditional tempeh and tofu production processes before the implementation of GMP and HACCP. The setup included the use of basic equipment, open-air processing areas, and limited hygiene controls, such as the absence of gloves, hairnets, and protective clothing. Key steps, such as soybean soaking, dehulling, boiling, fermentation, and pressing, are performed manually without



standardized sanitation procedures, temperature control, or environmental monitoring. In Indonesia, many tempeh producers operate on a small scale and adhere to conventional production methods (Romulo & Surya, 2021). These conditions increase the risk of microbial contamination, resulting in inconsistent product quality. In Indonesia, the most popular kind of tempeh is made by peeling, soaking, and fermenting soybeans with *Rhizopus oligosporus* (Romulo & Surya, 2021; Xiao, 2011; Suzihaque et al., 2024).

The implementation of food safety standards and production modernization in tempeh and tofu processing can improve product quality (FAO, 2023) and serve as an innovative strategy to enhance infant and young child nutrition, aligning with the recommendations of the Global Nutrition Report (2020) on locally based food interventions (Micha et al., 2020) which emphasize the importance of local food-based approaches to address malnutrition. However, prevailing traditional production methods do not yet guarantee optimal nutritional quality (Tenriawali et al., 2023; Desti Ambar Wati; Alifiyanto Muharramah, 2023; Candra MKes, 2020; Muharramah et al., 2023).

From an economic perspective, this aligns with enhanced production capacity and improved access to export markets in the region. Innovations such as premium packaging, halal certification, or "eco-friendly" labelling can strengthen the competitiveness of MSMEs, specially through digital marketing in global markets (Rista & Wahyuningsih, 2024). The use of recyclable or biodegradable packaging materials not only appeals to environmentally conscious consumers (SDG 12) but also maximizes product added value (Ekananda, 2023; Mayangsari, 2022) Moreover, product innovations such as tempeh chips, ready-to-eat tofu, and creatively flavored variants support SDG 12 (Responsible Consumption and Production) by reducing reliance on conventional product forms and minimizing food waste. Promoting tofu and tempeh as low-carbon protein sources contributes to climate change (SDG 13) because plant-based proteins generate significantly lower greenhouse gas emissions than animal-based protein sources. Livestock production accounts for approximately 14.5% of global emissions, and shifting toward sustainable alternatives, such as tempeh and tofu, offers a viable strategy for reducing the dietary carbon footprint while enhancing food security and nutritional intakes.

By aligning improved production standards with marketing innovation, tempeh can be elevated to a premium product, supported by sound financial management systems (Sri. P. Yuni. H. Rahmad. I. Y. Wahyuningsih, 2021) for micro, small, and medium enterprises (MSMEs). This transformation addresses universal challenges such as food insecurity, environmental change, and the need for inclusive economic growth while preserving the relevance of traditional foods in the face of modernity. Through a holistic approach, the tempeh industry serves as a tangible example of how



local MSMEs contribute to sustainable development by bridging cultural heritage with innovation and global responsibility. It is crucial to understand, however, that production is influenced not only by technical aspects, but also by social capital and deep cultural dimensions (Khan et al., 2025)

In recent years, the Indonesian food industry has faced increasing pressures from both domestic and global markets to meet higher safety, quality, and sustainability standards. The rapid growth of modern retail chains, online marketplaces, and institutional food programs has created new opportunities for tempeh and tofu MSMEs, yet it has also exposed their vulnerabilities in production, certification compliance, and market access. Practical challenges, such as limited technical knowledge, insufficient capital for upgrading equipment, and weak integration into formal supply chains, continue to constrain their competitiveness. Additionally, consumer demand is shifting toward products that are not only safe and nutritious but also environmentally sustainable and ethically produced, reflecting a broader global trend toward responsible consumption. These developments underscore the importance of examining how GMP, HACCP, and Halal certification can act as catalysts for market upgrading, enabling MSMEs to navigate complex socio-technical systems while maintaining cultural authenticity and contributing to public health, economic inclusion, and environmental sustainability. Understanding these dynamics provides critical insights for policymakers, industry stakeholders, and MSMEs seeking to leverage certification strategically in a rapidly modernizing food ecosystem.

## **LITERATURE REVIEW**

### **Strategic marketing and product repositioning**

The global food industry is currently undergoing significant changes. Consumers are becoming increasingly concerned about food safety, how products are made, and their religious beliefs about food. It has an important impact on whether people want to buy halal products (Koc et al., 2024) Traditional food products, such as tempeh and tofu, which are deeply rooted in Indonesian culinary culture, present both challenges and opportunities. Although tempeh is an affordable and nutritious protein source, it is often considered a low-value commodity in the informal markets. However, tempeh offers many health benefits, in addition, it has antidiabetic effects, cholesterol-lowering properties, enhanced cognitive function, anti-tumor and anti-cancer properties, anti-aging effects, improved gastrointestinal health, and a reduced risk of cardiovascular disease (Teoh et al., 2024).

Strategic marketing is essential for transforming traditional food products into a resilient and equitable food future. The global food sector must integrate food security, accessibility, sustainability, and informal market commodities into competitive and modern branded goods. Kotler et al., (2018) emphasize that effective marketing strategies involve product differentiation, branding, and value



communication to meet evolving consumer demands. In the context of Indonesian MSMEs, (Mel et al., 2023) argues that marketing must move beyond price-based competition and instead focus on quality, safety, and cultural authenticity to build brand equity. Packaging innovations, eco-labelling, and storytelling about local heritage can significantly enhance consumer perceptions and willingness to pay (Schiffman, 2019). To build nutrition into policy and practice, modern consumers increasingly value transparency, sustainability, ethical production, and factors that can be leveraged through strategic marketing for tempeh as a premium, healthy, and culturally rich food choice (Raposo et al., 2021).

### **Integration of Marketing, GMP, HACCP, and HALAL: A Synergistic Framework**

The integration of strategic marketing, GMP, HACCP, and HALAL certification generates a synergistic effect that promotes product quality and market competitiveness and builds customer demand, certification trust, and food safety systems to maintain product integrity. As (Barney, 1991) According to the Resource-Based View (RBV) paradigm, lasting competitive advantage comes from resources that are valued, uncommon, unique, and non-substitutable.

The combination of certification (GMP, HACCP, and HALAL) and branding has become a strategic resource for MSMEs in Indonesia. MSMEs. This integrated approach not only meets regulatory and consumer expectations but also supports SDG 8 (Inclusive Economic Growth) and SDG 12 (Responsible Consumption) by empowering small producers and promoting sustainable food systems (Dugarova & Gülasan, 2017). According to Abdullah et al., (2024) provide evidence from Southeast Asia, showing that MSMEs adopting this integrated model achieve higher sales, improved supply chain relationships, and greater resilience. HALAL certification can increase product competitiveness by up to 30% in Muslim-consumer markets (Pratikto et al., 2021) (Ab Talib et al., 2017). Currently, the demand for halal products is on the rise, driven by religious beliefs, health, hygiene, and taste preferences among both Muslims and non-Muslims (Genoveva & Utami, 2020) ; (Purwanto et al., 2020)

### **Contribution to SDGs**

The transformation of traditional foods through certification and marketing innovation coincides with many Sustainable Development Goals (SDGs) Tempeh and tofu, as low-carbon plant-based proteins, contribute to SDG 13 (Climate Action) by offering sustainable alternatives to animal-based proteins (FAO/ WHO, 2024). Their promotion supports SDG 2 (Zero Hunger) by improving access to affordable foods. Meanwhile, formalizing MSMEs through GMP, HACCP, and HALAL supports decent work and economic growth (SDG 8) by creating inclusive business opportunities



(UNDP, 2020). By linking food safety, religious compliance, and marketing strategies, this integrated approach demonstrates how traditional local foods can contribute to the global sustainability agenda.

### **Hygienic Production and Health benefits of Tempeh Consumption**

The implementation of GMP and HACCP has proven effective in reducing heavy metal contamination and microbiological hazards in tempeh. Simulation results showed that prior to system implementation, the cadmium (Cd) level in tempeh was recorded at 0.05 mg/kg by approaching the maximum limit recommended by Codex Alimentarius for soy-based products (0.1 mg/kg) (FAO/WHO, 2024). The elevated Cd levels are strongly attributed to the use of corroded metal production drums, which facilitate metal migration into the product during boiling and fermentation processes (Lee et al., 2019) (Sarker et al., 2022) (Mititelu et al., 2025) (Ungureanu et al., 2023).

Following the adoption of GMP and HACCP, the Cd levels in tempeh were reduced to below the detection limit (<0.005 mg/kg). This significant reduction resulted from replacing food-contact equipment with food-grade materials, such as stainless steel 304, improving sanitation procedures, and implementing critical control points to eliminate potential sources of metal contamination during production. These findings demonstrate that controlling equipment materials and raw material quality can substantially reduce heavy metal migration into food products.

In addition to heavy metals, microbiological evaluation revealed a marked improvement in coliform levels. Prior to system implementation, the average coliform count was  $3.5 \times 10^7$  CFU/g, exceeding the microbiological safety limits for fermented soy products such as tempeh. The primary causes of this problem include inadequate environmental sanitation, potential cross-contamination from washing water, and poorly controlled fermentation conditions. After implementing GMP and HACCP, coliform levels decreased drastically to <10 CFU/g and were undetectable in most of the samples. This reduction aligns with the implementation of HACCP in fermented soybean industries, which can reduce coliform contamination by up to 99% by strictly controlling washing, boiling, cooling, and fermentation processes. Thus, laboratory testing confirmed that the application of GMP and HACCP not only mitigated the risk of heavy metal contamination, such as Cd, but also significantly enhanced the microbiological safety of tempeh. These results corroborate the notion that integrated quality assurance systems of GMP and HACCP are a viable strategy for assuring food safety and prolonging the shelf life of traditional fermented food products.



**METHODOLOGY**

Soft Systems Methodology (SSM) was initially created by (Checkland, 2000) and (Stowell, 2016) in 1980s as a systemic approach to addressing complex and often unstructured management problems, particularly those arising within human activity systems. The evolution of Checkland’s conceptual development of SSM is reflected in several of his seminal works, beginning with *Systems Thinking and Systems Practice* (Checkland, 2000), followed by *Soft Systems Methodology in Action* co-authored with (Stowell, 2016); (Rennie, 1992), and *Information, Systems and Information Systems* (Checkland & Holwell, 2005); (Rose, 2000). A reflective analysis encompassing three decades of SSM development was later published as part of a special edition of *Systems Thinking, Systems Practice* (Checkland, 2000) (Jackson, 2003). These publications collectively illustrate the SSM’s trajectory as an interpretive and participative methodology in systems thinking (Checkland, 2000) It is shown in Figure 5, below is a detailed explanation of the seven stages of SSM based on the framework introduced by (Checkland, 2000) and (Burge, 2015) contextualized for research concerning the implementation of GMP, HACCP, and Halal certification in food industries such as tofu and tempeh production

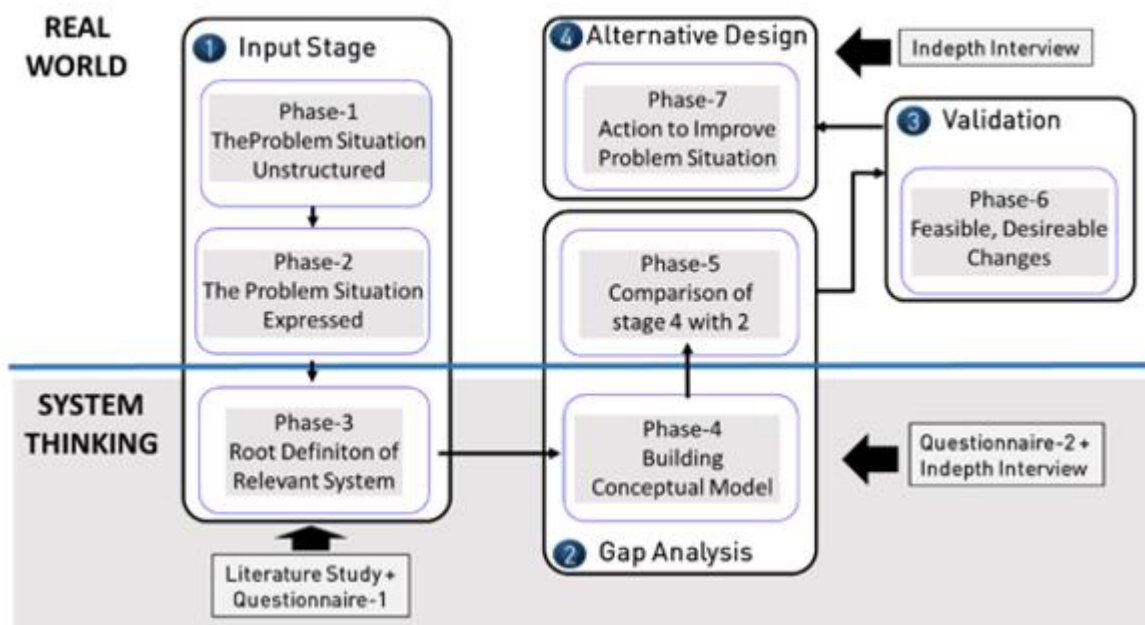


Fig.3. The Seven-Stages, Soft System Methodology Approach. Checkland, P. B. (1981)

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## **RESULTS**

### **Data**

This study used primary data collected through questionnaires and interviews with participants. Fifty participants were enrolled in this study. All respondents were tofu and tempeh MSME entrepreneurs in South Jakarta and members of the Primkopti Jakarta cooperative. The data of the respondents were as follows: educational background, majority of respondents were over 45–55 years old, 40% were under 46 years old 36% and 24% were over 55 years old. The educational backgrounds of most respondents were elementary school (42%), junior high school (54 %), and high school (4% were educated by D3-S1). Most of the respondents (92 %) had been in the tofu and tempeh industry for more than five years, and the remaining 8% had only been working for 1-5 years. Most respondents' sales targets are traditional markets and mobile stalls, which are as much as 93%, online sales 3%, stalls, and modern markets 2% each.

### **Understanding the challenges faced by tofu and tempeh businesses in South Jakarta.**

The initial phase of SSM involves delineating a problematic issue that remains unstructured and grounded in real conditions. Soft system analysis emphasizes the necessity and rationale for modifications in the existing system of intentional human behavior (Checkland & Holwell, 2005); (Al-Harrasi, 2017). SSM offers a framework and methodologies for examining "real-world" problem scenarios. Soft systems are intentional systems of human activity, structured to accomplish certain objectives among collaborating groups of individuals (Checkland, 2000).

The challenges associated with the application of GMF, HACCP, and Halal certification by tofu and tempeh entrepreneurs in South Jakarta can be illustrated using rich visualizations. The key elements of this phase are (i) understanding the relationships, components, and fundamental behaviors related to a problem scenario, and (ii) delineating a boundary within which the condition can be improved. A Rich Picture can be developed to aid analysts and participants in cooperatively understanding the problem environment. A detailed account of the researcher's expression of the difficulties in implementing GMF, HACCP, and Halal certification among tofu and tempeh entrepreneurs in South Jakarta. A rich picture of the researcher's expression of the problematic implementation of GMF, HACCP, and Halal certification of tofu and tempeh entrepreneurs in the South Jakarta area. The aim of this diagram was to explore various aspects of the situation without attempting to structure or analyze it.

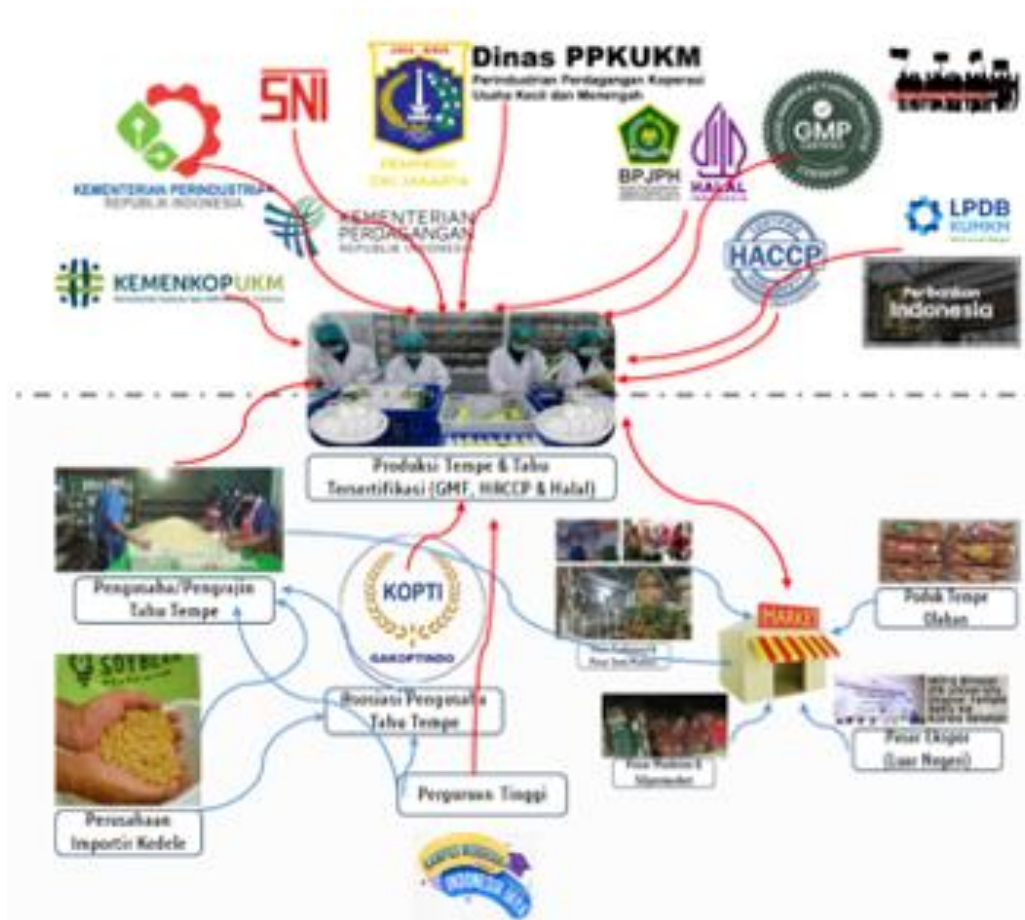


Fig.4. Rich Picture: The Problematic Situation of Tradional Tofu and Tempeh Entrepreneurs (Authors' own research)

(SSM) includes a systematic thinking technique known as **CATWOE**. **C**ustomers, **A**ctors, **T**ransformation, **W**eltanschauung (German for "worldview"), **O**wner, and **E**nvironmental Constraints are its six components, which highlight the fundamentals of converting inputs into outputs and aid in system exploration (Basden & Wood-Harper, 2006); (Bergvall-Kåreborn et al., 2004). **CATWOE** is helpful for uncovering insights into complex situations defined by different aims, diverse views, varying assumptions, and differing logic among numerous stakeholders (Jurevicius, 2025).



**TABLE 1: STEP OF CATWOE**

<b>Component</b>	<b>Explanation</b>
<b>C (Customers)</b>	End consumers (modern market, local consumers, ASEAN exporters), modern retailers, distributors, exporters, consumers of processed tofu-tempeh products.
<b>A (Actors)</b>	Tofu and tempeh artisans, the DKI Jakarta Health Office, the Department of Industry and Trade, BPOM, LPPOM MUI (for halal certification), HACCP Certification Centre, Regional Governments, Ministry of Trade, Ministry of Health, private sector (training and mentoring institutions), food MSME associations, banks or financial institutions.
<b>T (Transformation Process)</b>	From a traditional production process without standards to a tofu and tempeh industry that applies GMP (Good Manufacturing Practice) and HACCP (Hazard Analysis and Critical Control Point) systematically and documented to produce products that are safe, quality, halal, and have added value for the modern market and export.
<b>W (Worldview)</b>	The implementation of international food safety standards and halal certification can improve the quality of tofu and tempeh products, open access to modern markets and exports, increase the income of artisans, and support food security and small industries based on local wisdom.
<b>O (Owner)</b>	Local Governments (Health Office, Trade Office), BPOM, LPPOM MUI, food MSME associations, and financing institutions that foster and control artisans.
<b>E (Environmental Constraints)</b>	Government regulations related to food safety, ASEAN export standards, halal certification requirements, limited capital and technology of small artisans, low literacy of quality standards among small business actors, and changes in modern market tastes.

(Authors' own research)

A situational analysis of the transformation of traditional tofu and tempeh entrepreneurship was conducted using questionnaires and in-depth interviews. The analysis identified three major issues.

The first important issue is the low awareness of good tofu and tempeh production processes among entrepreneurs. Increasing consumer confidence in product quality is important for the industry.

This is reflected in the fact that only 52% of respondents had heard of the term GMP (good manufacturing product), and the remaining 48% had never heard of the term GMP at all.



Most entrepreneurs (88 %) were aware of the importance of maintaining cleanliness during the production process. All respondents carried out a production supervision process that included cleaning tools before use, checking the quality of raw materials, storing processed products in a clean place, and cleaning the production site after the completion of production. However, 60% of the respondents did not use standard clothes and work equipment.

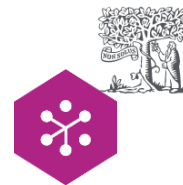
The second issue is that tofu and tempeh producers do not yet fully understand the importance of hazard control in the production process, or what is known as Hazard Analysis Critical Control Point (HACCP). Respondents' reactions showed that 58% of respondents had heard of the term HACCP, while the remaining 42% had never heard of the term. However, 68% of the respondents stated that it is very important to check the danger points in the tempeh manufacturing process, which is the basic principle of HACCP. In fact, they have taken important steps according to the HACCP principles, such as ensuring that the quality of soybeans is not damaged, ensuring the optimal amount of boiled water, maintaining the storage temperature of the products, and cleaning the production equipment.

Third, there is an absence of marketing strategies and product positioning. Marketing strategies are still carried out through traditional methods, and product positioning does not show tempeh as a food with high nutritional value. This is reflected in the fact that 44% of respondents never added labels or other additional information to the packaging of tempeh products, such as the "hygienic product" label or the "Halal" label. However, 82% of the respondents were aware of the importance of product cleanliness for consumers, and approximately 80% of the respondents said that cleanliness and taste could increase the competitiveness of products in the market.

Based on these three main issues, respondents faced obstacles to implementing a good and hygienic production process: 62% of respondents stated that implementing it requires high costs, 28% had not implemented it due to lack of knowledge, 6% had never received assistance (capital or technical), and the rest stated that they had limited places and weather factors that were not supportive.

#### **Root definition vs conceptual model: SSM Stages 3 & 4**

Based on this rich picture, the next step is to compile the root definition (RD) of the concept of sustainability. The preparation of RDs by (Checkland & Holwell, 2005), they may have utilized the PQR formula. The PQR formula represents a thing by going from P to Q and then R. The PQR formula helps researchers answer questions of what, why, and how in a research problem. To use the draft of RD as the basis for conceptual modeling, it must be tested and refined using CATWOE analytical tools (Hardjosoekarto, 2012); (Putri et al., 2022)



The root definition in this study is a system owned by researchers and practitioners of Shariah banking to enrich the model of Islamic banking governance based on the uniqueness of the Shariah economic system (P) through the development of a governance framework model based on intellectual capital and the uniqueness of the Shariah economy system typical of Indonesia (Q) to improve the performance and competitiveness of national Shariah banking in global market competition (R).

This study defines the root definition as a collaborative mechanism (P) through Good Manufacturing Practices (GMP), Hazard Analysis Critical Control Point (HACCP), and halal standards (Q) certification programs to improve production processes, quality, and product quality, making it more competitive to reach a wider product market, and meet export-oriented product standards (R).

The fourth step of SSM is conceptual model construction, which uses a purposive activity model to represent the process of expediting the application of GMP, HACCP, and halal regulations in the food industry. The model development process begins with the preparation of GMP, HACCP certification, and halal products for the tempeh production center, and the certification results are then listed as labels on the tempeh products of the Primkopti South Jakarta members. Figure 6 illustrates conceptual modelling as an action in the Purposeful Action Model (PAM).

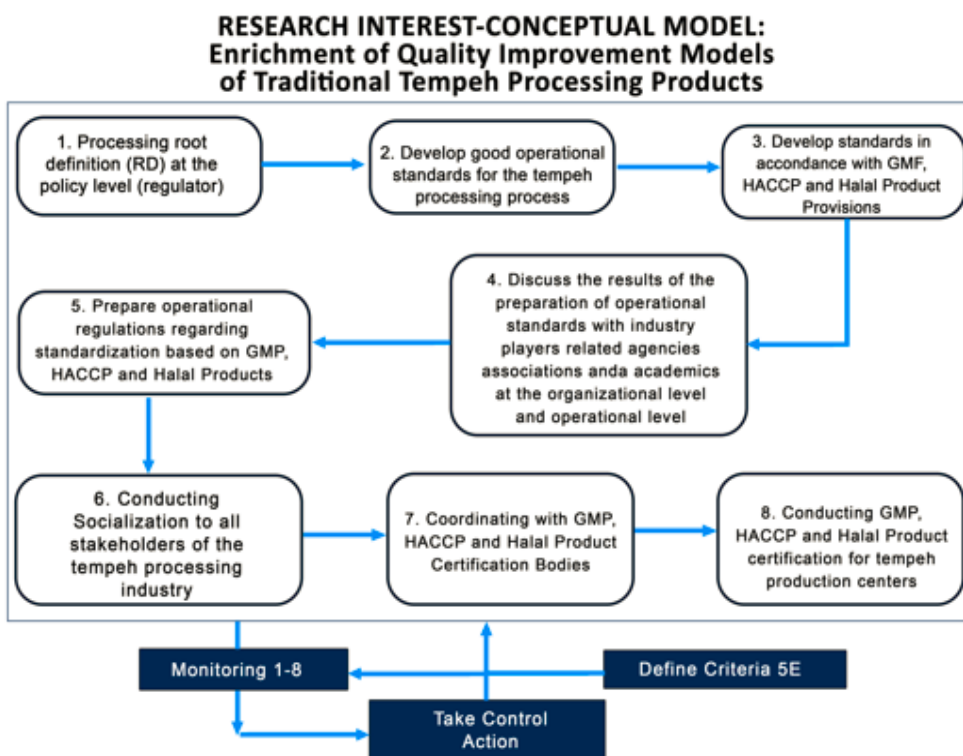


Fig 5. Purposeful Activity Model (PAM). (Authors' own research)



## **DISCUSSION**

This study shows that small and medium enterprises (SMEs) in South Jakarta have implemented documented practices of GMP, HACCP, and HALAL certification standards in a structured quality management system. However, some producers still intuitively follow traditional practices because they lack formal documentation, process integration, and institutional recognition necessary for market compliance in modern retail channels.

Rather than viewing this gap as a technical shortcoming, our findings reframe it as a systemic challenge shaped by three interrelated factors: (1) deeply embedded informal production traditions; (2) limited access to resources (e.g., capital, training, packaging); and (3) insufficient institutional support to bridge informal practice with formal requirements. This is in line with the perspective of Soft Systems Methodology (SSM), which emphasizes that transformation in a complex socio-technical environment cannot rely solely on technical solutions. Therefore, regular socialization and guidance are required to ensure compliance in implementing healthy, hygienic, and safe products.

The implementation of GMP, HACCP, and Halal certification should not be viewed as a regulatory burden but rather as a strategic marketing tool that can improve product quality, build consumer trust, open access to supermarkets and hypermarkets, and support the Free Nutritious Meals programme. However, as a safe, clean, and hygienically certified product, it has competitive potential in the modern market.

However, true modernization demands more than individual training or one-off certification assistance. It requires collective action: strengthening producer cooperatives, simplifying regulatory pathways for MSMEs, and providing targeted, context-sensitive support from local governments and certification bodies. Only through such systemic alignment can Indonesia transform grassroots food knowledge into a certified, scalable, and culturally resonant competitive advantage, one that simultaneously empowers local entrepreneurs, strengthens the national halal ecosystem, and advances inclusive food system development.

## **CONCLUSIONS**

This study highlights that the successful integration of GMP, HACCP, and Halal certification in tempeh and tofu MSMEs requires more than technical compliance; it depends on aligning standards with local practices, entrepreneurial mindsets, and coordinated support from government and market actors. Certification can enhance credibility and market access, but without process improvements and collaboration, MSMEs remain constrained in scaling up to modern retail channels. The findings underscore the importance of combining technical, organizational, and socio-cultural strategies to promote sustainable and inclusive growth in the traditional food sector. By framing food safety and



Halal certification as enablers rather than barriers, this research contributes to understanding how local MSMEs can achieve economic empowerment while preserving cultural heritage and supporting broader food system sustainability in Indonesia.

### LIMITATIONS AND FUTURE RESEARCH

Several limitations related to tempe production using the SMM, GMP, and HACCP approaches are as follows: First, this study was only conducted in South Jakarta, focusing on micro, small, and medium enterprises (MSMEs) that produce tofu and tempeh around Pasar Minggu. Therefore, the findings may not fully represent the producers in other regions. Second, data were obtained through surveys, interviews, and focus group discussions with MSME owners who sell tempeh themselves, without involving the perspectives of key external actors such as supermarket procurement officers, halal auditors, or consumers whose demands significantly influence market access. Third, although Soft Systems Methodology (SSM) helped identify systemic challenges, it did not provide quantitative evidence on how certification directly affects business performance, such as sales growth, cost efficiency, or profits.

Future research should apply a mixed approach with a financial analysis of tempeh sales revenue. This will provide stronger causal insights into supply and demand by revealing the income of tempeh entrepreneurs before and after receiving GMP, HACCP, and HALAL certification. Additionally, exploring the role of digital solutions, such as mobile-based quality monitoring, blockchain traceability, and online market integration, could reveal strategies that could accelerate the inclusion of traditional food producers into modern value chains.

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