

DEVELOPMENT OF A COMMUNITY-BASED SELF-MANAGEMENT PROCESS FOR SAFE FOOD IN KANCHANABURI PROVINCE, THAILAND

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ABSTRACT

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Action research was used to develop a community-based self-management process for safe food in the Nong Sarai subdistrict, Phanom Thuan district, Kanchanaburi province, Thailand. The research procedure consisted of three phases: (1) preparation; (2) planning and implementation; and (3) conclusion and reflection. The research participants were: 6 university researchers; representatives of 3 government agencies; and 30 community members, comprising community leaders and farmers, along with 558 household representatives. Quantitative data were collected using a questionnaire, while qualitative data were gathered through interviews and focus group discussions. The findings indicated that the Nong Sarai community had considerable potential for self-management through the creation of a learning ecosystem. Local economic data were integrated to develop two strategic plans, with one for safe rice production and the other for safe vegetable production. The outcomes of the self-management development process were: (1) the utilization of community-based data to integrate strategic plans at the subdistrict level and link them to community development projects; (2) increased community awareness of safe rice and vegetable consumption; (3) reduced production costs through the use of bioproducts; (4) the establishment of producer groups and the planning of safe vegetable production in accordance with standards; and (5) the expansion of safe food self-management practices from the model subdistrict to other learning subdistricts. A tangible outcome of this initiative was the sustainable intergenerational transfer of self-management practices for grassroots economic development.

Keywords: Self-management; community-based; safe food

1. INTRODUCTION

The Twelfth National Economic and Social Development Plan (2017–2021) emphasizes development guided by the Sufficiency Economy Philosophy, with a focus on people's participation to achieve balanced and sustainable national development. The aim is to foster a harmonious society across all dimensions through an

integrated holistic approach, capable of adapting to changes arising from economic, social, political, and environmental crises (National Economic and Social Development Board, 2016). This focus continues into the Thirteenth National Economic and Social Development Plan (2022–2027), which maintains the sufficiency economy philosophy as a guiding principle for driving and planning national development, framed by the vision of “Transforming Thailand into a Value-Based Economy for Sustainable Progress”. Agricultural development emphasizes building intellectual foundations to enhance resilience among agricultural communities and ensure food and energy security from sustainable agriculture. The 20-Year National Strategy (2017–2037) prioritizes agricultural development, particularly safe agriculture, focusing on developing agricultural products to meet international safety standards, as well as smart agriculture through the application of modern technology and science to improve product quality and the yield per unit area, while addressing the impacts of climate change (Land Development Department, 2021).

Community development emphasizing self-reliance is a suitable approach for long-term development, as it fosters a sense of collective ownership within the community. This aligns with the key principles of sustainable community planning, which focus on people as the center of development, emphasizing holistic integration and dynamic change, strengthening community resilience, promoting networks, and fostering cooperation both horizontally and vertically (Usavagovitwong et al., 2017). Additionally, creating learning networks among community members raises awareness and understanding of the changing contexts in the current era, leading to community self-management. This process enables communities to develop their capacity to manage resources, such as people, community organizations, and natural resources, to address problems and sustainably develop their communities. Local communities exhibit public consciousness, understand their goals, trust in their ways and community power, and possess the ability to manage their communities and relationships with stakeholders, using knowledge-management plans and community resources to solve problems and develop themselves systematically for structural change and sustainable development (Community Organizations Development Institute, 2011).

The “Nong Sarai Model” represents a self-managed community that serves as a model for development, utilizing historical pride as a unifying point to foster unity. Community leaders and members have established a working philosophy emphasizing human development based on the principle: “Develop people to build teams, develop teams to create work, develop work to ensure quality, and develop quality to establish standards,” aiming to create a moral society through community self-management. This collaborative effort promotes community participation and links with network partners. A distinctive feature of Nong Sarai subdistrict is the unity among village leaders, who cooperate with both formal and informal leaders, prioritizing community benefits under the support of network partners, which forms the foundation for fostering community solidarity. Thus, Nong Sarai is regarded as a model subdistrict for self-management, applying the “Community Master Plan for Self-Reliance” as a tool for planning life and directing community development towards sustainability.

Given the aforementioned background and its relevance, it is evident that national development policies prioritize food and energy security to achieve sustainable agriculture. The public sector emphasizes health care through the consumption of safe food. Therefore, there is an urgent need to support farmers in transitioning food production toward safety under established standards, with support from all sectors in production, value addition, and marketing to enhance the well-being of farmers and consumers and achieve a safe and environmentally sustainable lifestyle. Furthermore, Nong Sarai subdistrict is recognized as a model for developing the local economy through self-management processes and serves as a practical application for the Community Master Plan in the western central region of Thailand. In the current research, Nong Sarai subdistrict, Phanom Thuan district, Kanchanaburi province, Thailand was designated as the area for driving the development of self-management processes for safe food to elevate the local economy based on self-reliance in the production of safe rice and vegetables, with the potential for future expansion to other learning subdistricts.

2. RESEARCH OBJECTIVES

2.1 To analyze the potential for community-based self-management in the local economy of Nong Sarai subdistrict, Phanom Thuan district, Kanchanaburi province, Thailand.

2.2 To develop and implement a participatory self-management model for safe food production in Nong Sarai subdistrict, Phanom Thuan district, Kanchanaburi province, Thailand.

3. METHODOLOGY

This study applied an Action Research (AR) design, specifically following the cycle described by Kemmis and McTaggart (1988), which involves iterative loops of planning, acting, observing, and reflecting. This participatory framework was selected to bridge the gap between academic theory and community practice, fostering sustainable self-reliance in food safety management.

3.1 Research process

The research was executed through three systematic phases aligned with the AR cycle. The integration of these phases is illustrated in the flowchart in Table 1:

Phase 1

Preparation: Focused on context analysis and identifying financial leaks through baseline data. This phase utilized document analysis and preliminary interviews to establish the community's economic and social landscape.

Phase 2

Planning and implementation: Involved the collaborative design of a Strategic Plan for Safe Rice Production and a Strategic Plan for Safe Vegetable Production, alongside their respective Business Model Canvases (BMC). Implementation included the establishment of a learning ecosystem through study visits and knowledge exchange forums.

Phase 3

Conclusion and reflection: This final phase involved a meta-cognitive evaluation that transcended immediate project outcomes to identify transferable lessons in self-management applicable to diverse community challenges beyond agriculture. This reflective process considerably enhanced collective agency, fostering a transition in community identity from a passive model site to an active regional mentor.

Table 1: Flowchart of action research process

Phase	Core activities
Preparation	Context analysis and baseline economic data collection through document analysis, interviews, focus group discussions, and demographic questionnaires.
Planning and implementation	Development of strategic plans and business model canvases (BMCs) for safe rice and vegetable production.
Conclusion and reflection	Evaluation of outcomes and facilitation of intergenerational knowledge transfer through group discussions among researchers and community stakeholders.

3.2 Sampling and participants

The study used a dual sampling strategy tailored to the specific requirements of the AR cycle. A convenience sampling approach was utilized to recruit 558 household representatives to establish a baseline of the subdistrict's financial landscape. These participants were selected based on their availability and willingness to provide longitudinal economic data during the preparation phase. While this non-statistically based method was necessitated by the operational constraints of the AR timeline, the large sample size provided a sufficiently broad dataset to facilitate the immediate transition into the planning and implementation stages.

In contrast, the core participatory cohort ($n = 30$) was selected via purposive sampling to ensure deep, context-specific insights. This cohort was stratified into two functional groups: 21 primary rice farmers who maintain diversified livelihoods through supplementary vegetable cultivation on paddy ridges or household plots; and 9 village representatives serving as executives within the local vegetable-growing community enterprise. This targeted selection ensured that the individuals most central to the community's self-management potential were directly engaged in the research.

3.3 Research instruments and data analysis

3.3.1 Quantitative data

A structured demographic questionnaire was developed to collect financial data in Thai baht for ease of information provision by the Thai respondents. The demographic survey questions underwent content validation by a panel of three experts to ensure an item-objective congruence score above 0.66 for all items. Data were analyzed using descriptive statistics (percentage, mean) and converted to US dollars for international reporting.

3.3.2 Qualitative data

Qualitative insights were gathered using focus group discussions and semi-structured interviews. All sessions were audio-recorded with participant permission and supplemented by detailed field notes. To ensure data quality, the study used triangulation (comparing interview data with document analysis), member checking (returning findings to participants for verification), and peer debriefing among six university researchers. Content analysis followed a systematic coding process to develop themes related to self-management potential and strategic planning.

4. RESEARCH FINDINGS

4.1 Potential for self-management of community economy in Nong Sarai subdistrict

4.1.1 Context of self-management in Nong Sarai community

Historically, Nong Sarai was a part of Don Chedi subdistrict, Phanom Thuan district, Kanchanaburi province. It became an independent subdistrict in 1992, comprising 9 villages with an area of approximately 27 square kilometers. The topography is flat with sandy soil, and irrigation for all nine villages is provided by the Maeklong Irrigation Project. The total population in 2018 was 2,892, with 850 households. The primary occupation of the residents was general labor (32.88%), followed by agriculture (25.10%) (Phanom Thuan District Community Development Office, 2018).

The development of the Nong Sarai community aligns with a paradigm that fosters historical pride as a unifying point to create solidarity, encapsulated in the motto: “Local Agriculture, Civilization of Good People, Historical Valor, Uniting the Golden Land.” Community leaders and members have established a working philosophy emphasizing human development based on the principle: “Develop people to build teams, develop teams to create work, develop work to ensure quality, and develop quality to establish standards,” aiming to create a moral society through community self-management. This collaborative effort promotes community participation and links with network partners. A distinctive feature of the Nong Sarai subdistrict is the unity among village leaders, who cooperate with both formal and informal leaders, prioritizing community benefits under the support of network partners, which forms the foundation for fostering community solidarity. Nong Sarai is regarded as a model subdistrict for self-management, applying the “Community Master Plan for Self-Reliance” as a tool for planning life and directing community development towards sustainability.

4.1.2 Verification of community self-management through economic data analysis

The research team analyzed the potential for self-management of the community economy using demographic questionnaires targeting household representatives residing in Nong Sarai subdistrict; 558 respondents completed the questionnaire. Monetary amounts were collected in Thai baht to encourage respondents to provide as much financial information as possible in their local currency. Prior to analysis, all currency amounts were converted to US dollars using an exchange rate of USD 1 = THB 32.7355 as of September 25, 2020. Based on these responses, the analysis of the financial situation of the community revealed a total annual income of approximately USD 3.1 million, almost equally divided between agricultural income (48.5%) and non-agricultural income (51.5%). Total expenditure amounted to USD 1.8 million, with debts totaling USD 1.9 million. The community's total savings for the year were USD 553,603. At the household level, the average annual agricultural income was USD 4,640, while the average annual non-agricultural income was USD 4,517. Average household expenditures were USD 3,418, with average debts of USD 3,527.

The analysis of major expenditure data revealed that although the respondents cultivated rice, they also purchased a substantial amount for consumption annually. Specifically, the average annual household expenditure on rice was USD 286, leading to a total expenditure on rice of USD 188,334 for the entire subdistrict. In addition, the community engaged in vegetable cultivation as a supplementary occupation, with average annual household expenditure on fresh vegetables amounting to USD 201, resulting in a total expenditure of USD 132,538 for the subdistrict. Additionally, average annual household medical expenses were USD 351, leading to a total of USD 231,057 for the subdistrict. Although these data do not indicate that illnesses were caused by chemical use in agriculture, it has raised community awareness regarding health maintenance through the consumption of safe food.

4.1.3 Identifying community potential for self-management of safe food

The researchers organized a forum to present the results of the economic data verification and to identify the community's potential for self-management of safe food using SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis. The results of the community's potential analysis for self-management of food safety are detailed in Table 2.

Table 2: Results of community's potential analysis for self-management of food safety

Strengths		Weaknesses	
1.	Predominantly agricultural occupations	1.	Increasing expenditures
2.	Suitable land for agriculture	2.	Community debt is approximately 10 times higher than savings
3.	Abundant water resources	3.	Decreasing community income by approximately THB 30 million (USD 924,684)
4.	Development funds available (54% village funds, 37% savings groups, and 9% other funds)	4.	Community enterprise products lack certification (e.g., FDA standards)
5.	Strong leadership	5.	Health issues arising from food safety concerns
6.	Community leaders have the capacity to propose development plans for government funding	6.	Lack of public relations from government agencies regarding access to opportunities and public understanding
7.	Ability to be a learning community	7.	Issues with education quality in the area
8.	Strong community enterprises and organizations	8.	Limited understanding of accessing funding sources
		9.	Some land cannot be utilized effectively
Opportunities		Threats	
1.	Numerous organizational networks for development (e.g., Department of Agricultural Promotion, Department of Land Development)	1.	Uncertain and declining prices for agricultural products
2.	Government policies and budgets supporting agricultural activities at the community level (e.g., the Khok Nong Na Model, large-scale agriculture projects)	2.	Insufficient hospital services for patients
3.	University networks providing support and collaboration for funding and community development	3.	Increased land ownership by outsiders

4.2 Development of self-management plans for food safety in the community

The analysis of the community's potential for self-management of safe food revealed that the model community of Nong Sarai faced weaknesses and problems that needed to be addressed urgently, namely decreasing income, increasing expenditures, and deteriorating public health. Therefore, the research team, in collaboration with community leaders and representatives, gathered opinions to develop strategies to address these issues and to enhance the local economy concerning food safety by "reducing rice production costs, improving rice quality, and producing safe vegetables." To ensure successful implementation, the researchers and the community collaboratively developed a participatory self-management plan for food safety in Nong Sarai subdistrict to elevate the local economy, categorized into two plans: the participatory self-management plan for safe rice production and the participatory self-management plan for safe vegetable production.

4.2.1 Participatory self-management plan for safe rice production

The participatory self-management plan for safe rice production establishes a shared vision for safe rice production, focused on "developing innovations that lead to sustainable self-reliance." To clarify the implementation of safe rice production, a strategic plan for safe rice production was developed, aligning with community needs. The main strategies and action plans included:

1. Utilizing value chain innovations to enhance the operations of the Nong Sarai community, including an action plan for safe rice production that emphasizes farmer-produced rice seeds, strain selection, and innovative rice cultivation methods.

2. Creating a strategic team to drive the business plan toward achieving the shared vision, including action plans for developing community experts and training the next generation of farmers.

3. Establishing a systematic management mechanism for organizations, including action plans for data management and developing a learning center for safe rice cultivation.

4. Managing sustainable network relationships, including action plans for developing a model for safe rice management to expand the sustainable production network.

To set clear production goals and market planning, the community expressed the need to develop a business plan (Business Model Canvas: BMC) for safe rice production, titled "Business plan for safe rice, Nong Sarai subdistrict, rice season 2020/2021," with details outlined in Table 3.

Table 3: Details of business plan for safe rice, Nong Sarai subdistrict, rice season 2020/2021

Key business partners / Support units	Core activities for rice safety	Value proposition	Member relationships	Members
- Two farmer groups - Kasetsart University, Kamphaeng Saen (collaborative research and development) - Suphanburi Rice Research Center (seed support) - Rangsit University (procures milled rice) - Rice Department (GAP certification team)	- Network building - Promotion of safe rice production divided into two zones - Support for production factors - Monitoring/evaluation - Purchasing production according to the plan	- Knowledge sharing on safe rice production/value addition - Enhancing safety standards - Access to markets/sustainability	- Relationship management to create added value (increased income) - Online meetings (e.g., Zoom) for discussions and knowledge exchange	21 rice farmers
	Key resources - Leadership team - Strategy team - Data team - Rice varieties - Learning plots: Establishing demonstration plots for seed selection, model cultivation, and seed distribution		Channels to access customers and partners - Learning center - Community market (members who grow rice and residents) - Rangsit University	
Cost structure: Land preparation costs / seed costs / maintenance costs / harvesting costs / labor costs / rental costs (total expenses USD 1,024 per hectare)			Main income sources: Sale of rice seeds / sale of rice grains	

4.2.2 Participatory self-management plan for safe vegetable production

The participatory self-management plan for safe vegetable production establishes a shared vision for safe vegetable cultivation within the Nong Sarai community by “promoting safe vegetable cultivation to increase income, enhance community well-being, and ensure food security.” The primary strategies and action plans encompass:

1. Creating a group for safe vegetable cultivation, including action plans for awareness campaigns and establishing a safe vegetable production group.
2. Planning the distribution of safe vegetables to consumers, including action plans for finding representatives to collect and distribute products, direct sales to restaurants and hospitals, and creating specialized markets.
3. Enhancing the value of safe vegetables through action plans for branding Nong Sarai by registering and creating a community enterprise brand and planning for the cultivation of quality organic vegetables.

To facilitate effective implementation along the supply chain and promote sustainability in vegetable production for community consumption, group leaders and members devised a business plan (BMC) for safe vegetable production. This plan forms an integral part of the self-management initiative and is summarized in Table 4.

Table 4: Details of business plan for safe vegetable production in Nong Sarai subdistrict

Key business partners / Support units	Core Activities for safe vegetables	Value proposition	Member relationships	Members
- Kasetsart University, Kamphaeng Saen (collaborative research and development) - Phanom Thuan Hospital (customers) - Food retailers (customers) - Distributors (e.g., Mrs. Sawad Onkaew)	- Awareness campaigns and knowledge sharing on safe vegetable production for both producers and consumers - Planning the distribution of safe vegetables - Cultivation and sales according to the plan - Enhancing the quality and safety of vegetables	- Knowledge sharing on safe vegetable production/value addition - Elevating safety standards (branding Nong Sarai safe vegetables) - Access to markets/sustainability	- Relationship management to create added value (increased income) - Online meetings (e.g., Zoom) for discussions and knowledge exchange	30 vegetable farmers

Table 4: Details of business plan for safe vegetable production in Nong Sarai subdistrict (continued)

Key business partners / Support units	Core Activities for safe vegetables	Value proposition	Member relationships	Members
	• Monitoring/evaluation • Purchasing production according to the plan			
	Key resources • Leadership team • Strategy team • Four types of vegetable seeds • Bioproducts • Vegetable learning plots		Channels to access customers and partners • Distributors • Local food retailers • Community members • Chao Khun Phaiboon Hospital • Specialized markets	
Cost structure: Land preparation costs / seed costs / maintenance costs / harvesting costs / transportation costs / labor costs / rental costs			Main income sources: Sale of fresh safe vegetables	

4.3 Outcomes of participatory self-management development for safe food

4.3.1 Outcomes of participatory self-management development for safe rice production

Implementation of the participatory self-management plan translated the community's strategic priorities into coordinated action. Community leaders, farmers, researchers, and partner organizations worked together to strengthen local production capacity, improve knowledge exchange, and establish mechanisms that supported safe rice production. The outcomes extended beyond changes in farming practices. They strengthened local leadership, expanded learning networks, improved organizational capacity, and created a foundation for sustaining safe rice production through community self-management.

4.3.1.1 Building a strategic team to drive the self-management plan toward achieving the shared vision

The establishment of a community expert team involved identifying individuals within the community with expertise or experience in safe rice cultivation. These experts participated in knowledge exchange forums and disseminated information regarding self-produced rice seeds and strain selection to community enterprise groups or interested parties. Additionally, the team of next-generation farmers aimed to identify young individuals with the potential and dedication to continue the rice cultivation practices in Nong Sarai subdistrict, with a focus on developing their capacity to become leaders in innovative safe rice production. Consequently, the strategic team responsible for driving the self-management plan comprised both community experts and next-generation farmers, working collaboratively toward the shared vision of safe rice production in Nong Sarai subdistrict.

"...The cohort of emerging leaders participated in study visits and subsequently disseminated their findings through the Community Organization Leader Council. This led to the contextualized application of knowledge toward community self-management, ensuring alignment with our subdistrict's unique requirements..." (Informant no. 102, personal communication, April 9, 2021)

4.3.1.2 Creating learning ecosystem for strategic team strengthening

The campaign and dissemination of knowledge regarding safe rice production aimed to create a learning ecosystem to strengthen the group's capabilities based on self-management principles. Activities encompassed practical training on utilizing bioproducts to reduce rice production costs, study visits focused on rice strain improvement, and education on safe rice management throughout the supply chain. The creation of this learning ecosystem resulted in heightened awareness among target groups regarding safe agricultural practices, as exemplified by one farmer (Informant no. 77):

"...Talking together or going on study visits has increased our knowledge, which we can share with our children. We can apply what we learned in rice cultivation and share bioproducts with neighbors to increase their use..." (Informant no. 77, personal communication, November 17, 2020)

4.3.1.3 Utilizing value chain innovations to enhance production

The application of value chain innovations aimed to improve production by integrating existing knowledge through study visits and practical training tailored to local contexts. This involved establishing operational areas for experimentation in three themes: production of self-seeded rice; strain selection; and innovative safe rice cultivation methods.

“...We produce our own rice varieties; sourcing within our group is convenient and ensures full traceability. We know the exact provenance of the seeds and can easily monitor the cultivation sites...” (Informant no. 77, personal communication, April 9, 2021)

4.3.1.4 Establishing a systematic organizational management mechanism

The development of a systematic organizational management mechanism was conducted through an action plan focused on data management. This included creating databases for production, rice strains, membership, and marketing activities. The establishment of a database dedicated to innovative rice cultivation and strain selection, alongside the development of a learning center for safe rice cultivation and the documentation of lessons learned by farmers in Nong Sarai, aimed to disseminate knowledge within the community and to expand awareness networks to neighboring subdistricts such as Don Chedi and Nong Rong.

“...We see a clear path to successfully expanding our safe rice initiatives, because the land in Nong Rong and Don Chedi is naturally suited for rice farming; this is inherent to the geography of those areas. Meanwhile, here in Nong Sarai, we lay the foundation for that growth. We have already established the groundwork for processing the harvest, managing marketing, and connecting production networks to ensure the safety of rice and the integration of systems...” (Informant no. 77, personal communication, April 9, 2021)

4.3.1.5 Managing sustainable network relationships

The management of sustainable network relationships involved strengthening community enterprise groups and developing a model for safe rice management to expand the sustainable production network. Shared lessons learned between the Nong Sarai Sufficiency Economy Learning Centre and various networks aimed to establish a model for self-management of the local economy related to safe rice.

“...We are currently receiving institutional support from the Department of Community Development, the Department of Agricultural Extension, and the Rice Department, which has bolstered the stability of our community enterprise. We collaborate closely with the Nong Sarai Sufficiency Economy Learning Centre while maintaining vital network connections from the district level to the provincial level...” (Informant no. 72, personal communication, April 9, 2021)

4.3.2 Outcomes of participatory self-management development for safe vegetable production

4.3.2.1 Establishing a safe-vegetable cultivation group

The implementation of the strategies outlined in the self-management plan for safe vegetable production was conducted under the action plan for establishing a safe vegetable production group. Meetings with community leaders and interested farmers were held to establish the “Nong Sarai Community Enterprise Group for Safe Vegetable Cultivation,” comprising representatives from all nine villages as committee members (nine individuals).

“...During the subdistrict assembly convened on August 31, 2020, we passed a formal resolution to establish the ‘Nong Sarai Community Enterprise for Safe and Healthy Vegetable Cultivation.’ The assembly further mandated a consensus that the executive committee must maintain inclusive representation, requiring nine members drawn from each of the nine constituent villages...” (Informant no. 49, personal communication, April 9, 2021)

4.3.2.2 Creating a learning ecosystem to strengthen the vegetable production group

The campaign and knowledge dissemination for vegetable producers and community members aimed to create a learning ecosystem that strengthened the group according to self-management principles. Activities included: practical training on safe vegetable production and mushroom cultivation; training on organic certification standards; and knowledge exchange regarding value-added product innovations. The community demonstrated its capacity to be a learning community, as evidenced by representatives who shared knowledge gained from study visits with community members, ensuring that knowledge from these visits could be applied in a tangible manner. New generation leaders participated in study visits, sharing document information and insights through community leadership forums, and by reinforcing the connection between experienced leaders and new leaders, facilitated the application of knowledge for effective community self-management.

“...Upon our return, we engaged in a collaborative knowledge exchange within our group at the Nong Sarai Learning Center. We focused on synthesizing these new insights with our community’s traditional knowledge...” (Informant no. 50, personal communication, April 9, 2021)

4.3.2.3 Planning distribution of safe vegetables to consumers

The vegetable producers and community leaders planned the distribution of safe vegetables externally by: creating mobile sales units for safe vegetables; identifying collection points for distributing safe vegetables outside the community; developing an online market system using community product applications; and establishing cold storage facilities for safe vegetables, along with enhancing packaging design to attract consumer interest.

“...The majority of our consumers express high confidence in the quality of our safe produce, which is offered at equitable and fair prices. Based on this trust, we collaborated to identify strategic distribution channels, such as the Don Chedi and Phra Thaen community markets...” (Informant no. 72, personal communication, April 9, 2021)

4.3.2.4 Enhancing the value of safe vegetables through the Nong Sarai brand

Community leaders and youth representatives, both within the community and from the Nong Sarai network, agreed on the need to create a distinctive identity to increase recognition of Nong Sarai, particularly among visitors to Kanchanaburi province. This led to the establishment of the “Community Network Coffee Shop” to promote the Nong Sarai brand through coffee sourced from young farmers in Thong Pha Phum district, with sugar derived from organic cane and palm sugar produced in Nong Sarai subdistrict.

“...Within our group meetings, there was a clear consensus that we needed to establish a distinctive identity to enhance the public recognition of Nong Sarai. This strategic objective led to the conceptualization and establishment of the ‘Kanchanaburi Urban-Community Network Café’...” (Informant no. 77, personal communication, April 9, 2021)

4.3.2.5 Planning for quality safe vegetable cultivation

Following study visits, the group organized knowledge exchange forums and identified that Nong Sarai produced an insufficient amount of safe vegetables to meet local consumption demands. Consequently, the group recognized the high potential for vegetable marketing as a business opportunity but emphasized the need to prioritize collaborative cultivation planning. Data on the types of vegetables cultivated by each household were collected, focusing on quality and GAP (Good Agricultural Practices) standards. Based on the results, the farmers voluntarily participating in safe vegetable cultivation ordered their seeds from the Tropical Vegetable Research Centre at Kasetsart University, Kamphaeng Saen Campus, Thailand due to their confidence in the quality of the seeds, based on their study visit experiences regarding proper seed selection and storage.

The establishment of the safe vegetable cultivation group, planning for the distribution of safe vegetables, and enhancing the value of safe vegetables have promoted vegetable cultivation as a supplementary income source during the off-season for rice cultivation, ensuring effective implementation within the supply chain and sustainability in vegetable production for community consumption, as well as expanding into business systems to elevate the local economy.

“...Our decision to procure vegetable seeds from the Tropical Vegetable Research Centre at Kasetsart University is rooted in our high degree of confidence in the genetic quality of the inputs and their cost-effectiveness. Our success is defined by our ability to leverage vegetable cultivation as a supplementary income stream during the fallow periods between rice seasons...” (Informant no. 82, personal communication, April 9, 2021)

4.3.3 Expanding self-management of safe food from model subdistricts to learning subdistricts

The expansion of self-management of safe food from model subdistricts to learning subdistricts has facilitated the application of knowledge to reduce production costs within their communities. This process involved exchanging expertise with the Nong Sarai network and local agricultural specialists concerning the reduction of rice seed quantities to promote enhanced growth, as well as using bioproducts for pest management in rice fields. Consequently, two experimental plots were established. Comparative analysis of results before and after implementing these practices in the expanded areas demonstrated a 20% increase in rice production from 1.6 hectares, with an average yield of 164 kilograms per hectare. A cost comparison revealed that reducing the quantity of rice seeds and substituting bioproducts for chemical fertilizers and pesticides decreased production costs by up to 25%. Furthermore, post-harvest, the community leaders and farmers planned to utilize bioproducts to decompose rice straw, thereby improving soil fertility. Reflecting on the outcomes of the expansion, it is evident that learning subdistricts have begun to acknowledge the significance of self-management, with leaders serving as role models. The key determinant of successful expansion resides in proactive leaders who are eager to acquire knowledge and demonstrate a willingness to adapt. Once proficient, these leaders apply their knowledge effectively, resulting in tangible improvements that foster the adoption of reduced chemical usage for safe food production and consequently contribute to the enhancement of the local economy (Table 5).

Table 5: Comparative outcomes of self-management process (Pre- vs. Post-intervention)

Focus area	Baseline (Pre-intervention)	Outcomes (Post-intervention)	Impact/Change
Rice production costs	High reliance on chemical fertilizers and pesticides	Substitution with bioproducts and reduced seed quantities	25% reduction in costs
Agricultural yield	Standard yield based on traditional methods	Average yield of 164 kg per hectare in experimental plots	20% increase in rice production
Economic self-reliance	USD 188,334 spent annually on purchasing rice for consumption	Integration of Strategic Plan for Safe Rice to improve self-sufficiency	Increased retention of local capital through self-production
Vegetable production	Insufficient safe vegetables to meet local demand	Formation of Nong Sarai Community Enterprise Group with 9-village committee	Transition from home use to business system expansion
Knowledge transfer	Older generation practicing traditional methods	Establishment of “Next-Generation Farmer” teams	Sustainable transfer of self-management practices
Environmental health	Awareness of health issues from chemical use	Systematic reduction in chemical application and use of bioproducts	Improved natural ecosystem and population health

The tangible outcomes encompassed the sustainable transmission of self-management practices aimed at developing the local economy from older generations to the younger generations. Notably, new-generation farmers have begun to assume roles in spearheading innovations in safe rice cultivation and in developing online market systems utilizing community product applications. This development aligns with the perspectives of community leaders, who emphasize that for the sustainability of Nong Sarai’s self-management, it is crucial to cultivate a new generation of leaders who are committed, eager to learn, and dedicated to serving the common good, while also being equipped to harness technology and adapt to evolving economic, social, and environmental conditions.

The advancement of self-management processes for safe food in the Nong Sarai subdistrict has clearly highlighted the community’s dedication to establishing a learning ecosystem to foster a robust team. Community leaders have recognized the importance of utilizing community databases for planning community development towards self-reliance and managing self-sufficiency in safe food to bolster the local economy in response to changing circumstances and to ensure sustainability. Economically, this has resulted in reduced household expenditure and increased income derived from the sale of safe vegetables within the community. Socially, it has fostered learning networks that expand self-management practices within the community, thereby improving public health. Environmentally, the reduction in chemical use has yielded a positive impact on the natural ecosystem of the community.

5. DISCUSSION AND CONCLUSION

The empirical evidence from the Nong Sarai community underscores that successful safe food self-management is a function of high social capital and systematic organizational structures. The success factors identified in this study—leadership, shared goal-setting, network support, and core community values—closely mirror the “5 Gs” framework proposed by Issaradet and Limrattanaphattarakun (2020). Specifically, the “Good Leader” and “Good Team” components were observed in the community’s ability to mobilize 30 key leaders to facilitate focus groups and drive the safe food agenda.

The present study extended the “Good Planning” dimension by demonstrating how the BMC can be operationalized at the grassroots level to transform traditional farming into a value-based safe food enterprise. Unlike prior descriptive studies, these findings suggest that a 25% reduction in production costs was not merely an economic outcome but a result of “Good Participation,” wherein community members collectively opted for bioproduct substitution over chemical reliance. Furthermore, the Good Planning aspect was evidenced by the application of the BMC, which transitioned the community from traditional subsistence farming toward a professionalized “Safe Food Brand.” This systematic approach validated the findings of Yoganit and Sungrugsu (2010), who argued that Nong Sarai’s social capital was not merely a cultural trait but a functional asset that fostered collective learning.

The findings from the present action-research study offer major implications for rural development policy and agricultural practice. First, decentralized economic planning suggests that policymakers should shift from top-down agricultural subsidies toward supporting Community Economic Databases. When communities are empowered to conduct their own household expenditure surveys, as demonstrated in the present study, motivation for self-management increases because problems become visible and quantifiable. Secondly, the

integration of business tools in social agriculture indicates that agricultural extension officers ought to be trained in business modelling. Equipping farmers with tools to analyze value propositions and customer segments (including hospitals and school lunch programs) is vital for transforming safe food from a niche project into a sustainable market entity. Thirdly, intergenerational mentorship models should prioritize the development of “Learning Ecosystems” that pair elder farmers—keepers of traditional wisdom—with youth—drivers of technological and marketing innovation.

This study has contributed to the broader domain of community development by presenting a replicable ‘Nong Sarai Model’ of integrated food security. While most food security studies emphasize global supply chains, this research demonstrates that community-based food security can be achieved successfully through localized self-management (Hamm & Bellows, 2003). The transition from chemical dependency to biological self-reliance exemplifies the ‘Middle Path’ of the Sufficiency Economy Philosophy, which emphasizes reasonableness and self-immunity (National Economic and Social Development Board, 2016). By fostering local participation and economic roots, the community addresses structural poverty, aligning with the conceptual framework of developing sustainable, community-rooted food systems that enhance local self-reliance (Feenstra, 2002).

6. RECOMMENDATIONS FOR FUTURE RESEARCH

6.1 Future action research should concentrate on expanding knowledge and technology to develop value-added products derived from safe rice, such as using rice as medicine or incorporating it into cosmetics. An additional area for investigation involves enhancing the value of rice field production by integrating rice cultivation with tourism, culture, art, and environmental sustainability, such as through repurposing traditional rice storage facilities for tourism purposes.

6.2 Future action research should persist in supporting the transition from monoculture vegetable production to diversified, safe vegetable cultivation that satisfies consumer demand within the community, while also preparing to elevate production standards to GAP or organic standards. There may be benefits in developing technology for processing vegetables into healthy foods, targeting specific groups such as government employees or individuals with limited cooking time. Finally, consideration should be given to promoting the cultivation of medicinal herbs as an alternative for farmers.

DECLARATION

1. Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

2. Generative AI and AI-assisted technologies in the writing process

During the preparation of this manuscript, the authors utilized Grammarly to refine linguistic precision and enhance the overall readability of the text. Following the use of this tool, the authors reviewed and edited the content as needed and assert full accountability for the integrity, interpretation, and final conclusions presented in the work.

3. Data availability statement

The datasets generated and analyzed during the current study available from the corresponding author upon reasonable request.

4. Ethics statement

The authors have obtained informed consent from all individuals included in this study.

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6. Contributor Role Taxonomy (CRediT)

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