The Communication Model for Promoting the Low-Carbon Society Concept in the Restaurant Business for Sustainability in Surat Thani Province

Kullatip Satararuji*, Prasittachai Dechkham

Abstract

Purpose: This study aimed to examine how restaurant entrepreneurs in Surat Thani Province communicate low-carbon practices, how consumers perceive these efforts, and to develop an effective communication model for promoting sustainability within the restaurant sector. **Research design, data and methodology**: A mixed-methods approach was employed. Qualitative data were collected through interviews with 23 restaurant entrepreneurs selected by purposive sampling, and analyzed using content analysis. Quantitative data were obtained from 180 customers through a validated questionnaire, and analyzed with descriptive statistics. **Results and conclusions:** The finding revealed that entrepreneurs promoted low-carbon practices through the use of local ingredients, energy conservation, and waste management. They communicated these efforts through social media, government channels, and community networks. Consumers were generally aware of tangible actions like reusable containers and eco-friendly packaging, but paid less attention to less visible practices like food waste reduction. Based on these insights, the study proposes an integrated communication model that combines both online and offline strategies to effectively promote environmental responsibility among restaurant operators and consumers.

Keywords: Low-carbon society, restaurant communication, sustainable consumption, consumer perception, environmental responsibility, Surat Thani Province

JEL Classification Code: E44, F31, F37, G15

1. Introduction

Climate change, driven by global warming, has emerged as a critical global challenge with widespread impacts on the economy, society, and environment. In response, many countries have prioritized reducing greenhouse gas (GHG) emissions, with the promotion of "low-carbon cities" become a core strategy. This approach encourages reduced energy and resource consumption in everyday activities to support sustainable development (Sereenonchai & Arunrat, 2020).

The low-carbon society concept aligns closely with the Sustainable Development Goals (SDGs), particularly SDG 11 (sustainable cities and communities), SDG 12 (responsible consumption and production), and SDG 13 (climate action) (UNDP, 2022). Reducing food waste (SDG 12.3) and promoting recycling (SDG 12.5) are also integral

to this effort (United Nations Development Programme [UNDP], 2022). However, despite the clear targets set by the SDGs, a gap remains in translating these goals into restaurant operations. Consumers often have uneven awareness of environmental measures, while entrepreneurs lack clear, effective communication strategies to bridge understanding and foster genuine engagement at the operational level.

The restaurant sector is a significant contributor to carbon emissions due to its use of raw materials, energy consumption, and waste generation. However, research in the Thai context suggests that environmental management within this sector remains underdeveloped. Many restaurant businesses operate without systematic environmental strategies and show limited awareness of circular economy principles (Kachacheewa et al., 2022). This is particularly evident in tourism-driven provinces such as Surat Thani,

1*Kullatip Satararuji, GSCM Lecturer, Graduate School of Communication Arts and Management Innovation, National Institute of Development Administration, Thailand. Email: kullatip@gmail.com

2 Prasittachai Dechkham, LIT Lecturer, Modern Business Management, Faculty of Business Administration and Technology, Lampang Inter-Tech College, Thailand, Email: prasitchaide@gmail.com

where high consumption levels are accompanied by limited communication of sustainability policies to both entrepreneurs and consumers at the operational level.

Effective communication thus plays a crucial role in increasing awareness and fostering behaviors that support the transition toward a low-carbon society. Recent studies show that credible and interactive communication significantly influences consumer awareness, satisfaction, and environmentally responsible behavior in restaurant settings (Chaturvedi et al., 2024; Sereenonchai & Stewart, 2024). These findings underscore the need for communication models that are contextually grounded and effective in promoting sustainable food consumption.

Given this context, this study seeks to develop a communication model tailored to the restaurant industry, particularly in Surat Thani Province which is rich in natural and tourism resources. This study aims to generate practical insights and strategies to guide restaurant businesses toward environmentally responsible practices, while concretely contributing to the achievement of the SDGs.

2. Research Objectives

1. To examine the communication practices of restaurant entrepreneurs who incorporate the low-carbon society concept into their business operations.

2. To explore consumer perceptions regarding their experiences with restaurants that implement low-carbon practices.

3. To develop a communication model for advancing the low-carbon society concept within the restaurant sector.

3. Literature Review

3.1 Sustainable Development and the Low-Carbon Society

Sustainable Development refers to a development process that meets the present needs without compromising the ability of future generations to meet theirs. It emphasizes a balance between economic growth, environmental preservation, and social equity. Thailand has adopted the United Nations' Sustainable Development Goals (SDGs), particularly SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), and SDG 7 (Affordable and Clean Energy), into the National Economic and Social Development Plan to promote efficient resource use, waste reduction, and the advancement of a circular economy. A low-carbon society seeks to reduce carbon emissions by encouraging energy efficiency, green technologies, and reduced reliance on fossil fuels. Thailand's goal of cutting GHG emissions by 20% by 2030

is supported by policies such as the 13th National Economic and Social Development Plan and the Urban Green Growth Strategy.

3.2 Social media and Sustainable Communication

Social Media refers to digital platforms that use internet-based technologies to facilitate interactive communication. Users can create, share, and exchange content in real time across various formats, including text, images, audio, and video (Kaplan & Haenlein, 2010; Williamson, 2013). In the context of sustainable restaurant businesses, social media, such as Facebook, Instagram, and TikTok, plays a critical role in communicating low-carbon practices such as sourcing local ingredients, waste management, and urban farming. They help raise awareness and shape environmentally responsible brand images, while also promoting sustainable consumer behavior.

3.3 Perception Theory

Perception is a psychological and behavioral process in which individuals respond to stimuli, interpret, and assess situations based on experience and environmental context (Sudla, 2007). Explains that awareness develops through a cognitive process: exposure to stimuli → comprehension → knowledge acquisition → awareness → behavioral response. Effective communication must therefore be grounded in accurate information that supports informed decision-making.

3.4 Environmentally Friendly Restaurant Business

Eco-conscious restaurants contribute significantly to sustainability by focusing on efficient resource use, waste reduction, and community-based sourcing—principles aligned with the green economy framework. Green restaurants also implement environmentally responsible practices across all stages: from sourcing and cooking to service and waste management, while fostering community engagement. Sereenonchai and Arunrat（2020）identifies best practices in four domains: (1) eco-friendly food production (e.g., use of organic ingredients, food waste reduction), (2) service and support (e.g., reducing single-use plastics, encouraging reusable containers), (3) energy and environmental management (e.g., energy-efficient appliances, wastewater treatment, waste segregation), and (4) management and community participation (e.g., local hiring, support for local products, environmental outreach). These practices align with SDG 12 and SDG 13 by promoting sustainable production and consumption, and climate action.

Table 1: Theoretical Foundations and Their Relevance to Research Objectives

Theoretical Foundation	Key Concepts	Relevance to Research Objectives	Supporting Authors
Sustainable Development & Low-Carbon Society	- SDGs integration (SDG 7, 12, 13) - 20% GHG reduction target by 2030	- Policy framework for low-carbon practices (Obj. 1) - Context for communication model (Obj. 3)	Sereenonchai and Arunrat (2020)
Social Media & Sustainable Communication	- Digital interactive platforms - Real-time content sharing	- Analyze communication practices (Obj. 1) - Understand consumer engagement (Obj. 2) - Communication channels for model (Obj. 3)	Kaplan and Haenlein (2010)
Perception Theory	- Stimulus interpretation process - Exposure → awareness → behavior	- Explain consumer perceptions (Obj. 2) - Guide communication model design (Obj. 3)	Sudla (2007)
Environmentally Friendly Restaurant Business	- Four practice domains - Resource efficiency focus	- Define low-carbon practices (Obj. 1) - Assess consumer experiences (Obj. 2) - Implementation guidelines (Obj. 3)	Sereenonchai and Arunrat (2020)

4. Conceptual Framework

Based on the literature review, the study developed a conceptual framework focusing on three components. First, it examines the communication practices of restaurant entrepreneurs incorporating low-carbon principles. Second, it explores consumer perceptions toward restaurants that implement low-carbon practices. These two components serve as the foundation for developing a communication model aimed at promoting and advancing low-carbon concepts within the restaurant sector.
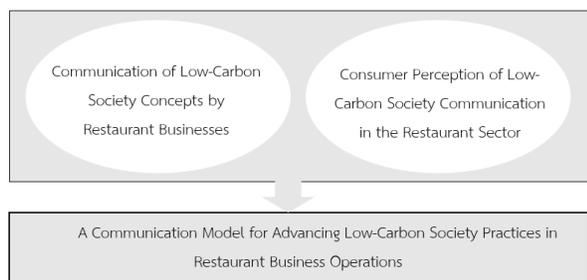

Figure 1: Conceptual Framework

5. Research Methodology

This study adopted a mixed-methods approach to explore communication practices and perceptions related to low-carbon initiatives in restaurant businesses in Surat Thani Province. The integration of both qualitative and quantitative methods provided a comprehensive understanding of the topic.

A concurrent mixed-methods design (Creswell & Plano Clark, 2018) was employed, in which both qualitative and quantitative data were collected simultaneously to ensure comprehensive triangulation. The rationale for this approach lies in its ability to integrate entrepreneurial insights with consumer perspectives in real time, enabling cross-validation of data and the construction of a more robust communication model. The findings from both datasets were integrated at the interpretation stage, particularly in the development of the communication model, allowing the researchers to compare, complement, and contrast stakeholder perspectives systematically.

This concurrent approach directly supported model development by allowing real-time comparison between entrepreneur communication strategies and consumer responses. The simultaneous data collection revealed gaps between what entrepreneurs communicate and what consumers actually understand, which became key elements

in designing the final communication model.

For the qualitative phase, semi-structured interviews were conducted with 23 restaurant entrepreneurs and employees in Koh Samui District. Participants were selected using purposive sampling, based on their experience with low-carbon practices. The interview guide was validated by three experts, with Index of Item-Objective Congruence (IOC) values between 0.67 to 1.00. Data were analyzed using inductive content analysis guided by sustainable communication theory. Data saturation occurred after 18 interviews when no new themes emerged. The final 5 interviews confirmed that all relevant insights had been captured.

For the quantitative phase, a survey was distributed to 180 restaurant customers using a convenience sampling method. The sample size followed Roscoe's. guideline, which suggests a range of 30 to 500 participants for behavioral research. The questionnaire was validated (IOC = 0.67-1.00) and achieved a reliability testing, yielding a Cronbach's Alpha of 0.89. Descriptive statistics—frequency, percentage, mean, and standard deviation—were used to analyze the results (Creswell & Plano Clark, 2018).

The integration of qualitative and quantitative findings focused on identifying discrepancies between entrepreneur communication practices and consumer perceptions. These comparative interpretations revealed communication gaps that directly informed the development of the final communication model.

6. Results and Discussion

6.1 Results

The results are presented according to the research objectives as follows:

6.1.1 Communication Practices of Restaurant Entrepreneurs

The study found that restaurant entrepreneurs in Koh Samui have concretely adopted the low-carbon concept in their operations. This was reflected in resource management, sustainable sourcing, and environmentally friendly services—such as using locally grown ingredients, reducing plastic usage, and managing kitchen waste efficiently. These actions aim to build a sustainable business image, particularly in eco-tourism destinations.

In terms of external validation, environmentally conscious restaurants were subject to regular inspections and received certifications from public health offices, municipalities, and tourism authorities. For instance:

"We are inspected periodically by the Public Health Office and always meet their standards."

(Sabiang Lay 2, Bangrak, Bophut)

"We are certified by the municipality and the Public Health Office."

(Khrua Sawoei Restaurant, Nathon)

Regarding communication channels, entrepreneurs employed diverse strategies, including online platforms such as Facebook, YouTube, websites, and customer reviews, as well as offline tools like infographics and mainstream media articles. These channels were utilized to disseminate sustainable practices and enhance their public image:

"We use LINE, our Facebook page 'Ban Suan Langsat,' YouTube, an article in the Bangkok Airways in-flight magazine, and TV programs arranged by a customer who owns Hilton Hong Kong."

(Ban Suan Langsat Restaurant)

"We use online and social media platforms, 95% targeting international audiences, to build an online reputation through reviews and search engine visibility."

(Pen Siri Restaurant)

"We put up signs about our collaboration with Trash Hero and donate proceeds from reusable water bottles to the foundation, which we publicize on social media."

(Hachiya Coffee Roastery)

In terms of communication networks, restaurant owners formed partnerships with local communities, environmental foundations, and business networks—particularly with organizations like Trash Hero, which promotes the use of reusable drinkware and other sustainability-focused initiatives:

"We implement the low-carbon concept through our business network. At Thara Resort, we grow pesticide-free vegetables and fruits for use in our restaurant and on our eco-tourism boats, where we reduce plastic by using reusable trays."

(Khrua Sawoei Restaurant, Nathon)

"We serve as a solar energy learning site for local students, using 100% solar power."

(Phulipa Jungle Camp)

In summary, the communication practices of restaurant entrepreneurs demonstrated a proactive approach—through tangible actions, public expression, and collaborative networks—to shape an environmentally responsible and sustainable business image.

6.1.2 Consumer Perception of Low-Carbon Practices in Restaurants

Consumer perception regarding the adoption of low-carbon practices in the restaurant industry was explored from two perspectives: those of restaurant operators and consumers.

6.1.2.1 Entrepreneurial Perspective

From the entrepreneurial perspective, efforts to foster consumer awareness were evident across four primary areas:

1) Use of Local and Safe Ingredients: Consumers recognized the commitment of restaurants to environmental sustainability through their use of locally sourced produce—such as indigenous vegetables, coastal seafood, and self-grown herbs and greens within the premises.

"We grow our own kitchen garden and use local ingredients."

(The Nature Restaurant)

"Customers can witness our staff harvesting fresh herbs for cooking right at the restaurant."

(Lukkai Lek Restaurant)

2) Environmental Stewardship: Some restaurants managed their spaces using eco-friendly materials and organized nature-related activities such as waste sorting points, biodegradable containers, or nature tours such as dolphin watching.

"We use environmentally friendly items such as paper bags, paper straws, and reusable glasses."

(K.O.B. Restaurant, Nathon)

"We conduct nature-based activities, like dolphin tours and waste disposal at designated stations."

(T-K Tour)

3) Digital Communication: Restaurants conveyed their environmental values via digital menus, social media, and online platforms to engage customers and build a green brand image.

"We use digital menus and tag our posts with #wastereduction and #CleanSamui."

(Hachiya Coffee Roastery)

"We showcase our menu and ambiance through Facebook, TikTok, and Google Maps."

(Rao Restaurant, Bang Makham Beach)

4) Zero Waste Principles: Many restaurants adopted comprehensive waste management strategies with an emphasis on waste sorting and the holistic waste reduction system.

"We place small bins under tables to encourage customers to sort their waste."

(Mae Lampha Boat Noodle Restaurant)

"Our zero-waste approach minimizes pollution holistically."

(The Hive Hotel)

6.1.2.2 Consumer Perspective

A survey of 180 consumers who had visited restaurants implementing low-carbon practices showed that most respondents were female, with an average age of 34. The majority were employed in operational roles, earned between 15,000 and 25,000 baht per month, and had completed secondary or vocational education.

In terms of awareness, consumers demonstrated a generally high level of recognition regarding the environmental practices adopted by these restaurants. The most commonly noticed actions included the use of reusable utensils and containers, followed by the use of locally sourced ingredients and biodegradable packaging. However, fewer respondents were aware of measures aimed at reducing food waste—such as utilizing all parts of meat or vegetables. This indicates that consumers are more responsive to tangible, visible environmental actions than to behavioral changes that require personal adaptation.

Overall, the results reflect a growing awareness of sustainable practices in the dining experience, but also highlight the need for more effective communication strategies to foster deeper understanding and engagement with low-carbon behaviors.

6.1.3 Communication Models for Promoting the Low-Carbon Concept in Restaurant Businesses

Based on interviews with restaurant entrepreneurs, the communication model for advancing the low-carbon concept in restaurant operations can be categorized into three distinct forms: online communication, offline communication, and integrated communication. Each mode offers unique strengths and strategies for fostering awareness and encouraging sustainable behavior among consumers.

6.1.3.1 Online Communication

Online platforms—particularly social media channels such as Facebook, Instagram, TikTok, Google Maps, and customer review sites—are extensively utilized by restaurants to share content related to sustainable practices, including local ingredients, kitchen gardening, waste separation, and eco-conscious operations.

"We should promote low-carbon and waste-sorting practices via social media."

(Mae Lampha Boat Noodle Restaurant)

"We use social media to showcase our herb harvesting process."

(Lukkai Lek Restaurant)

"Customer reviews reflect our green business identity."

(Muang Samui Restaurant)

6.1.3.2 Offline Communication

Offline communication focuses on community-based activities, awareness campaigns, local events, and employee-led communication. Traditional media and physical signage are used to build credibility and strengthen connections with the local community.

"We organize waste-sorting education activities for children and youths and ensure they are sustained over time."

(Sabienglae Lamai Branch 1)

"Staff play a key role in delivering accurate environmental messages to customers."

(Flo Restaurant)

"Communication should be part of a long-term strategic plan to be memorable."

(Khrua Savoey Restaurant, Nathon)

6.1.3.3 Integrated Communication

An integrated approach combines both online and offline methods, including digital platforms, word-of-mouth communication, influencer marketing, and community engagement activities. This multi-channel strategy significantly broadens message reach and enhances public engagement.

"Integrating influencers like Chef Chumphon or Opal helps broaden awareness of the low-carbon concept to the general public."

(The Nature Restaurant)

"The use of digital media and influencers enhances our brand visibility and credibility."

(Lukkai Lek Restaurant)

"Google Map reviews, Twitter shares, and search engine optimization effectively reach modern consumers."

(Siriphoka Restaurant, Bang Por)

Respondents also emphasized the importance of tailoring communication strategies to specific target audiences, maintaining consistency and accuracy in messaging, and introducing policy incentives—such as tax, water, and electricity reductions—to support entrepreneurs in sustaining low-carbon initiatives.

"Information should be customized for target groups, consistently communicated, and backed by incentives such as tax or utility discounts."

(Lacoppola Restaurant)

"Local media should be prioritized to preserve indigenous knowledge and promote community participation."

(Chit Phosana 3 Restaurant)

In summary, an effective communication model for promoting the low-carbon concept in restaurant sector should adopt a holistic, integrated approach that combines online media, offline communication, interpersonal channels, influencer involvement, and community-based activities. This comprehensive strategy enables wide-reaching impact, engages diverse audiences, and fosters long-term behavioral change and the sustainable branding of restaurant enterprises.

6.1.4 Integration of Qualitative and Quantitative Findings

The integration of qualitative data from restaurant entrepreneurs and quantitative data from consumers provides a multidimensional view of low-carbon communication practices. While entrepreneurs emphasized diverse communication strategies—including community engagement, visual signage, and social media storytelling—consumers showed higher awareness of only visible and tangible practices, such as the use of reusable containers and biodegradable packaging.

This indicates a perceptual gap between what restaurants implement and what consumers internalize. For example, although zero-waste cooking and solar-powered operations were highlighted in interviews, such practices were not commonly recognized by consumers in the survey. This misalignment highlights the need for improved message framing and visibility.

Additionally, both groups acknowledged the importance of social media as a key communication tool, confirming its role as a bridging platform. However, entrepreneurs also valued offline and interpersonal communication to build local trust, while consumers placed less emphasis on these.

These findings suggest that an effective communication model should not only use multi-channel strategies but also prioritize making invisible or indirect low-carbon practices more visible, relatable, and relevant to consumer perception.

Figure 2: The Communication Model for Promoting the Low-Carbon Society Concept in the Restaurant Business for Sustainability

6.2 Discussion

6.2.1 Implementation of Low-Carbon Concepts in Restaurant Operations

The study found that restaurant operators in Koh Samui have effectively translated the low-carbon society concept into tangible practices, including the use of locally sourced ingredients, the reduction of plastic consumption, and the implementation of efficient waste management systems. These practices align with the "Low-Carbon Society" principles, which emphasizes the reduction of carbon emissions throughout production and operational processes (Environnet, 2022). Moreover, these practices contribute directly to the achievement of Sustainable Development Goals (SDG) 12 (Responsible Consumption and Production) and SDG 13 (Climate Action). These efforts also reflect the concept of "Sustainable Business," which highlight environmental and social responsibility—an approach supported by Kachacheewa et al. (2022), who emphasize the importance of efficient resource and energy use in modern restaurant operations.

The findings suggest that the integration of low-carbon practices not only benefits environmental outcomes but also enhances the long-term sustainability and credibility of businesses operating in tourism-dependent regions like Koh Samui.

6.2.2 Consumer Perceptions of Low-Carbon Restaurants

This section of the study is discussed from both the entrepreneurial and consumer perspectives. Restaurant operators actively promoted awareness in four key areas: (1) sourcing local and safe ingredients, such as self-grown vegetables and locally caught seafood, which aligns with the concept of Environmental Embeddedness in Food—a practice that enhances local sustainability and supports SDG 2.4 (sustainable food production systems) and SDG 12.3 (reducing food waste); (2) environmental stewardship through the use of biodegradable materials, nature-related activities, and systematic waste separation, reflecting principles of Eco-Friendly Service Design and Circular Economy, both of which advocate efficient and responsible resource use; (3) sustainability communication via digital menus, social media, and online reviews, which contributes to building a strong "green image" consistent with the findings by Blondin et al. (2022), who argue that environmental communication fosters brand loyalty and behavior change; and (4) waste management through Zero Waste strategies, which support SDG 12.5 (substantially reducing waste generation) and align with Cognitive-Behavioral Theory (Bandura, 1986), emphasizing that behavior is shaped by an enabling environment.

From the consumer perspective, the study found a high level of awareness, particularly regarding tangible practices such as reusable containers, locally sourced ingredients, and biodegradable packaging. However, awareness was significantly lower regarding less tangible behavioral aspects, such as zero-waste eating and full-ingredient utilization. This indicates a stronger influence of Tangible Actions over personal dietary habits, supporting Ajzen's Theory of Planned Behavior, which states that perceived behavioral control and attitudes significantly influence behavioral intentions. The findings also suggest consumers' receptiveness to digital communication formats, aligning with SDG 9 (Industry, Innovation, and Infrastructure) and SDG 12.8 (Promoting Sustainable Lifestyles Through Information Access).

6.2.3 Communication Model for Promoting Low-Carbon Concepts in Restaurants.

The communication model that emerged from the study encompasses three distinct forms: (1) Online Communication—leveraging platforms such as Facebook, Instagram, TikTok, and Google Maps aligns with the principles of Communication for Social Change, which emphasizes structured access to information and public participation. This supports SDG 9 (Industry, Innovation, and Infrastructure) and SDG 12.8 (Promoting sustainable lifestyles through information access). Research by Blondin et al. (2022) underscores the effectiveness of participatory digital content in enhancing ecological awareness, consistent with Bandura's (1986) Social Cognitive Theory, which highlights the role of observational learning in shaping behavior; (2) Offline Communication—involving community events, employee interaction, environmental campaigns, and engagement with local media—reflects Participatory Communication, which is deeply rooted in cultural and social contexts. This form supports SDG 11.4 (Protecting Cultural and Natural Heritage) and SDG 13 (Climate Actions) by embedding low-carbon values into local behavior. The use of service staff to explain sourcing and production processes also resonates with the Service-Dominant Logic framework that focuses on co-creating value with consumers; and (3) Integrated Communication—combining digital, face-to-face, word-of-mouth, and influencer channels—illustrates Integrated Marketing Communication (IMC) strategies aimed at delivering consistent and impactful messaging. This approach expands consumer reach and supports SDG 17 (Partnerships for the Goals). The involvement of influencers like celebrity chefs further facilitates Social Transmission, encouraging behavior change among new consumer segments (Yang Xu & Jeong, 2019).

In addition to these communication strategies, many participants recommended government support in the form of policy incentives—including tax relief and utility subsidies—to encourage and sustain environmentally

responsible practices. These suggestions reflect principles of Policy Communication, which advocate for multi-sectoral collaboration to drive systemic change in sustainability transitions.

6.2.4 Integration of Stakeholder Perspectives and Communication Gaps

The integration of qualitative and quantitative findings reveals both convergence and divergence between the perspectives of restaurant entrepreneurs and consumers regarding low-carbon communication practices. Entrepreneurs reported employing a wide range of communication strategies—including social media campaigns, signage, staff engagement, and community-based activities—to convey their commitment to sustainability and low-carbon operations.

However, survey data indicated that consumers were primarily aware of tangible and visible practices, such as the use of reusable containers and biodegradable packaging. In contrast, less visible back-end practices, such as solar-powered systems, zero-waste cooking, and comprehensive waste sorting, were less frequently recognized. This perceptual gap aligns with the concept of *invisible sustainability*, in which sustainability efforts that are not directly observable by consumers often go unnoticed or unappreciated.

Moreover, while both groups identified social media as a crucial communication tool, qualitative insights revealed that entrepreneurs placed greater value on offline and interpersonal channels—such as direct staff-customer interaction and educational campaigns in schools and communities. These were perceived as essential for building long-term trust and reinforcing a sustainable brand identity. Consumers, however, appeared to place less emphasis on these channels, reflecting a discrepancy in how communication efforts are received and valued.

This divergence highlights the need for a more integrated communication strategy that not only employs multiple platforms but also frames less visible practices in ways that make them tangible and emotionally resonant to consumers. Such framing can enhance consumer understanding and engagement, ultimately encouraging more meaningful behavioral change.

Finally, participants in the qualitative phase emphasized the importance of government support and policy incentives, such as tax reductions and utility subsidies, for businesses actively implementing low-carbon practices. This suggests a role for policy communication in strengthening cross-sector collaboration among public agencies, private enterprises, and consumers to achieve a broader sustainability transition (Howlett, 2009). A multi-stakeholder communication model that integrates top-down policy incentives with bottom-up community engagement may therefore be essential in advancing low-carbon goals within the restaurant industry.

6.2.5 Model Replication and Adaptation Potential

This communication model can be adapted for use in other provinces and business types. The three approaches—online, offline, and integrated—offer flexibility to match local conditions and resources.

Different provinces need different communication strategies. Bangkok and urban areas should focus on digital channels due to high internet use. Rural provinces work better with community activities and face-to-face communication. Tourist areas like Phuket or Chiang Mai can use the integrated approach, while local markets should emphasize personal relationships and word-of-mouth.

Other businesses can adapt this model too. Hotels can use integrated communication across all guest interactions. Small cafes work well with community engagement and staff conversations. Food delivery apps can focus on online transparency about their environmental practices.

Success depends on understanding local culture, economic conditions, and government support. The basic ideas—being transparent, making practices visible, and involving stakeholders—work everywhere, but how you apply them must fit the local situation.

7. Conclusions

This study reveals that restaurant entrepreneurs in Koh Samui have actively adopted low-carbon practices and communicated them through diverse strategies. Online platforms—especially social media and digital review systems—played a significant role in raising public awareness. These efforts were complemented by offline communication, including staff engagement, community-based activities, and educational initiatives. Notably, the integrated communication approach—which blends online, offline, and influencer-driven strategies—proved to be the most effective in fostering sustainable brand identity and enhancing consumer engagement.

From the consumer perspective, there was a high level of awareness regarding visible low-carbon practices, such as the use of reusable utensils, locally sourced ingredients, and biodegradable packaging. However, less attention was paid to less tangible practices like whole-food consumption. This suggests a need for deeper communication strategies that shift consumer values toward comprehensive sustainability behaviors.

The findings support the development of a three-pronged communication model (online, offline, and integrated) tailored to promote low-carbon concepts in the restaurant sector, encouraging both business innovation and consumer

participation in sustainable development.

The implications of these findings can be examined from both theoretical and practical perspectives.

7.1 Theoretical Implications

This study advances understanding of sustainable communication by showing how traditional communication theories can address modern environmental challenges. The research demonstrates that perception theory, combined with social media frameworks, provides valuable insights into how consumers process sustainability messages.

The mixed-methods approach revealed communication gaps that single-method studies might miss, particularly the disconnect between what entrepreneurs do and what consumers notice. This finding highlights the importance of making environmental messages visible and tangible for effective communication.

The study also bridges sustainable development theory with practical communication strategies, showing that communication serves both as a tool for promoting sustainability and as an outcome of successful environmental initiatives.

7.2 Practical Implications

For restaurant operators, this study provides a clear framework for communicating sustainability initiatives more effectively. The key insight is making invisible practices visible—solar power, waste sorting, and zero-waste cooking should be showcased creatively rather than assumed customers will notice them automatically.

The three-tiered model offers flexibility for businesses with different resources. Small establishments can focus on staff training and community engagement, while larger operations can use comprehensive integrated approaches combining digital marketing with hands-on experiences.

Marketing professionals can use these findings to develop better sustainability campaigns by prioritizing visible, tangible elements while finding creative ways to communicate less visible practices. The emphasis on genuine community engagement helps build authentic connections rather than superficial green marketing.

From a policy perspective, the research shows the importance of government support through tax incentives and communication assistance programs. Tourism authorities can develop coordinated sustainability communication strategies that help visitors understand and appreciate local environmental initiatives.

8. Recommendations

8.1 Policy Recommendations

1) Promotion of Low-Carbon Business Practices: Government agencies should establish clear and supportive policies to encourage restaurants in adopting low-carbon practices. These may include tax incentives, financial subsidies, and capacity-building programs to ease a smooth transition toward environmentally responsible operations.

2) Public Awareness Initiatives: State and local authorities should actively engage in raising public awareness about low-carbon societies through public education campaigns and grassroots activities, thereby fostering sustainable consumption patterns across communities.

3) Standardization of Communication Practices: It is recommended that a national or industry-specific framework for communicating low-carbon practices in the restaurant sector be developed. This would ensure consistency, credibility, and reliability in information conveyed to consumers.

4) Cross-Sector Collaboration: To drive meaningful progress, the government should encourage partnerships among public institutions, private enterprises, and civil society organizations. These cross-sector efforts would facilitate shared responsibility in advancing the low-carbon agenda within the food service industry.

8.2 Practical Recommendations

1) Operational Integration of Low-Carbon Practices: Restaurant operators should embed low-carbon principles throughout their business processes, ranging from ingredient sourcing to customer-facing communication strategies.

2) Adoption of Multi-Channel Communication: Effective outreach should utilize a combination of online platforms and offline touchpoints to engage diverse target audiences and maximize impact.

3) Transparent and Reliable Messaging: Environmental communication must be conveyed clearly, accurately, and accessibly to ensure consumers understand the value and significance of low-carbon practices.

4) Stakeholder Involvement: Active collaboration among stakeholders—including suppliers, customers, and local communities—is essential for co-creating and reinforcing sustainable restaurant practices.

5) Monitoring and Continuous Improvement: Ongoing evaluation mechanisms should be implemented to measure the effectiveness of environmental initiatives, identify challenges, and drive continuous innovation in sustainability efforts.

8.3 Recommendations for Future Research

1) Assessment of Long-Term Impacts: Future research should examine the long-term effect of low-carbon communication on consumer behavior, attitude transformation, and overall business sustainability.

2) Development of Segment-Specific Strategies: Researchers should explore customized communication strategies tailored to various consumer segments, considering their distinct values, preferences, and media consumption habits.

3) Role of Emerging Technologies: Further research is warranted to investigate how digital innovation and emerging media platforms can enhance engagement, interactivity, and the overall effectiveness of low-carbon communication in a rapidly evolving digital landscape.

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