

SUSTAINABLE FOOD MANAGEMENT IN ISLAND TOURISM: LESSONS FROM HOME-BASED CAFÉ (HBC) IN TERENGGANU SMALL ISLANDS

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ABSTRACT

Background and Purpose: Despite global initiatives, including the Sustainable Development Goals (SDGs) to end hunger by 2030, food security remains a critical issue in small islands heavily reliant on tourism. These islands are highly vulnerable to climate change, natural disasters, market fluctuations, and inefficient food distribution systems. In Malaysia's small island destinations, such as Perhentian Islands and Redang Island, limited local resources and dependence on mainland supplies further challenge small-scale food businesses, including home-based cafés (HBC), to sustain their food security. Guided by the four pillars of food security theory, this study explores food security challenges and coping strategies on rural small islands.

Methodology: Adopting a qualitative approach, semi-structured interviews with 17 HBC operators on Perhentian Islands and Redang Island were thematically analyzed using ATLAS.ti software.

Findings: Our study confirmed that food security pillars (availability, accessibility, utilization, and stability) contributed to the understanding of food security in HBCs on small islands, and poor food supply chains negatively impact food security and sustainability of HBCs. Our findings exposed key food security challenges, such as high reliance on mainland goods, expensive island living costs, the monsoon season, and high tourism dependency. Findings further highlighted several coping strategies involving supply chain management, operational adjustments, and financial management, focusing on people-centered strategies.

Contributions: This study suggests that the lack of integrated supply chain management involving local island communities and relevant agencies increases the potential threat of food insecurity, thereby affecting the overall sustainability of HBCs on islands.

Keywords: Food security, Food tourism, Home-based café, Sustainability, Small islands.

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1.0 INTRODUCTION

Food security encompasses physical, social, and economic access to adequate, safe, and nutritious food at all times, providing individuals with their dietary needs and preferences for a healthy and active life. It refers to obtaining nutritious food for optimal health and well-being, as described by the Food and Agriculture Organization (FAO) (Sharma, 2006; Abdullah et al., 2020; Sulaiman et al., 2021). The importance of securing food security, as recognized through the Sustainable Development Goals (SDGs) 2030, is to end hunger and enhance food security. However, recent reports suggest that the achievement of these goals continue to face significant challenges (Mohd Nor, 2023), particularly due to factors such as natural disasters (Mohammadi et al., 2022), the COVID-19 pandemic (Abdullah et al., 2020; Mohammadi et al., 2022), economic instability (Sadati et al., 2021), inefficient food distribution systems (Sharma, 2006), and reliance on food imports (Sharma, 2006; Teng, 2020; Tortajada & Lim, 2021; Mohammadi et al., 2022).

With global challenges impacting many nations, Malaysia's food security is also at risk, threatening the availability of staple foods (Rajendran, 2023). Despite efforts to enhance local food production, Malaysia has yet to achieve self-sufficiency in key staples, worsening food insecurity during crises. Consequently, challenges such as food price inflation, climate change, and heavy reliance on food imports further heighten food security risks. For instance, the December 2024 floods in Malaysia devastated over 100 hectares of farmland across five states (Johor, Melaka, Perak, Kelantan, and Terengganu), leading to vegetable price surges of 50-80% due to supply shortages (Rajendran, 2025). As food prices rise, this issue directly burdens lower-income households, forcing them to spend a large portion of their income on food or cut essential food they can no longer afford. This issue is even more severe in rural and isolated areas, especially small island destinations (SID). With limited land, geographic isolation, vulnerability to natural disasters, and deep integration into global markets (Lowitt et al., 2015), it further complicates the existing constraints in securing the food supply chain.

Given their isolated nature, small islands are heavily dependent on mainland supplies, making them highly vulnerable to disruptions (Teng, 2020). Various challenges, including limited land availability, labour shortages (Teng, 2020), geographical isolation, governance issues, institutional barriers, and climate change, further worsen food supply constraints in SID (Mohammadi et al., 2022). Recent studies by Tharim et al. (2024) and Chew (2020) supported our observation on the lack of grocery store availability on Perhentian Islands and Redang Island, which offer only basic household needs. As reported by previous research, food resources on Perhentian Islands were rated as "dissatisfied," with both villagers and business owners facing daily reliance on mainland supplies due to insufficient local stock. While Redang Island has relatively larger grocery stores, the high cost of goods has led many villagers to continue depending on mainland sources. The limited product variety further reinforces the mainland's role as the primary provider of diverse food options for both islands. These constraints highlighted the urgent need for further research on food security in SID, particularly to enhance data availability and informed policy discussions aimed at strengthening food security in rural island communities (Mohammadi et al., 2022).

The impact of such constraints extends to local food services, including HBC, which are vital in sustaining both villagers and tourists on Perhentian Islands and Redang Island. As tourism flourishes, demand for diverse food options has driven the rise of independent and unregulated home-based cafés (HBC). The emergence of HBCs have recently increased both in urban and rural landscapes, as people lost their jobs due to the economic recession triggered by the COVID-19 pandemic and government-imposed movement control orders (MCOs), forcing the closure of many food and beverage businesses, including restaurants and food production facilities (Abdullah et al., 2020; Surendran, 2021). In response to these issues, many people turned to alternative means of generating income by establishing a business from home.

While such businesses were initially a secondary source of income, many have evolved into full-fledged cafés, expanding their physical space and menu offerings. This transformation has been further accelerated by favourable factors, including low start-up costs, which have contributed to the steady growth of HBCs in Malaysia. Newberry and Bosworth (2010) noted that business owners often test business concepts at home before scaling up, making HBCs a cost-effective incubator for small ventures (Limon, 2021). Thus, the shift toward HBCs has provided financial relief for individuals affected by the economic downturn.

However, despite the growing presence of HBCs, food security remains a challenge, especially in small island destinations, where consistent and reliable food access depends heavily on mainland supplies (Teng, 2020). Given their importance in food tourism, this raises a concern: how do HBC operators adapt to the existing constraints to sustain their food supply? To bridge this gap, understanding the food security challenges helps to develop sustainable, effective solutions. A prior study also emphasized the importance of further research into the survival tactics and hurdles encountered by micro-scale food business owners (Azman & Majid, 2023).

Despite the rising popularity of HBCs, there is still a lack of empirical studies examining food security issues in HBC operations, particularly in rural settings. The increasing prominence of HBCs underscores the need for further academic inquiry to enhance data availability and provide evidence-based insights. Grounded by food security pillars (availability, accessibility, utilization, and stability), this study aims to investigate the food security challenges and coping strategies developed among HBC operators on Perhentian Islands and Redang Island.

While Malaysia has established a relatively robust long-term food policy, its implementation within the food service sector in isolated areas continues to face various challenges. A more targeted policy for small islands and rural tourism destinations could strengthen HBC's food security. Addressing these gaps will not only support the sustainability of HBCs in maintaining their food supply chains but also assist policymakers in formulating food security policies that correlate with the boundaries of the marine ecosystem.

2.0 LITERATURE REVIEW

2.1 Concept of Food Security

Food security remains a global concern, extending beyond hunger to include access to sufficient, safe, and nutritious food. It is commonly defined as a state where all people, at all times, have physical, social, and economic access to food that meets their dietary needs and preferences for a healthy life (Sulaiman et al., 2021; Sadati et al., 2021). This food security concept can be broken down into four main components known as the four pillars of food security theory, focusing on food availability, access, utilization, and stability (FAO, 2006). Food security will be threatened at all levels, from individual to global, by obstacles in any of these dimensions. Malaysia follows this framework in its National Food Security Framework (KSMN), aligning with the Food and Agriculture Organization (FAO).

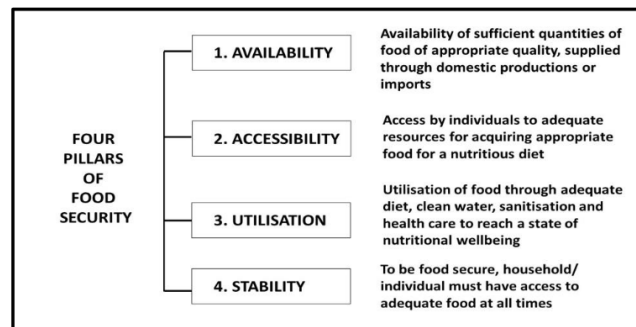


Figure 1: Four pillars of food security (FAO, 2006)

Food availability refers to the physical presence of food, either through domestic production or imports (Gibson, 2012). A reliable food supply is crucial for food security, relying on effective production and distribution systems. Hence, any losses in agricultural production or unsustainable farming practices may affect food availability, making them vulnerable to food insecurity (Sulaiman et al., 2021). Although local food production is crucial, imports play a complementary role in addressing shortages resulting from production constraints (Burchi & De Muro, 2015). This is evidenced in small island communities, where geographical limitations necessitate reliance on imported food due to insufficient natural resources and limited water availability for agriculture (Teng, 2020). Yet, even if food is available, issues like inadequate infrastructure, uneven distribution, and poverty can limit access (Mohammadi et al., 2022; Sulaiman et al., 2021).

Consequently, individuals need to be able to access food physically and economically to secure food security (Gibson, 2012). This aligns with the food accessibility dimension, which refers to the ease of obtaining food within a specific geographic area (Andress & Fitch, 2016). From a physical perspective, the proximity of food outlets and the quality of road connectivity are critical factors in ensuring reliable access to food (Sulaiman et al., 2021). Individuals without transportation have a hard time doing grocery shopping (Andress & Fitch, 2016). Therefore, island communities tend to face hurdles in obtaining food when they do not have boats. From a financial perspective, individuals' purchasing power and food prices play a crucial role in determining their ability to access food and the affordability of food (Teng, 2020). Those with lower incomes often face financial constraints that limit their food choices, potentially leading to reliance on cheaper, less nutritious food options. For example, in Ecuador and Latin America, food insecurity is primarily caused by economic limitations rather than food shortages, as agricultural output exceeds population needs (Ayaviri-Nina et al., 2022). Even though food is available in the market, access to it is limited due to high poverty rates, reflecting an uneven distribution of resources.

Nevertheless, having the ability to access food physically and financially is inadequate to ensure food security when individuals do not have the knowledge and skills to make good use of the food (Aborisade & Bach, 2014). This aspect is known as food utilization, where the knowledge and skill of basic food nutrition and safety are crucial. The food should be properly stored, used, and processed to ensure it is safe and nutritious for meeting individual dietary needs. FAO (2008) stated that good feeding practices, food preparation, diversity of the diet, and intra-distribution of food result in sufficient energy and nutrient intake by individuals.

Finally, food security is achieved when food stability is ensured, allowing households to maintain consistent access to sufficient and nutritious food (FAO, 2006). Food stability encompasses both availability and accessibility, even in the face of disruptions such as climate change, political instability, and economic challenges. Moreover, economic conditions, cultural dynamics, and development levels play a crucial role in shaping food stability, as they influence individuals' capacity to produce, access, and consume food (Ghalibaf et al., 2022).

These factors are critical for vulnerable regions, including small islands, where external shocks may impact food supply chains.

2.2 Challenges of Food Supply Chains on Small Islands

Small islands' geographic limitations raise a different concern from those of larger nations with abundant natural resources of land and water to support agriculture (Teng, 2020). The lack of sufficient resources, such as land and water, poses a major challenge to sustaining the food supply chain in small island communities. To address this issue, small island communities on Perhentian Islands and Redang Island have to rely heavily on external food sources, including staple foods and animal proteins, to meet their dietary needs. No supermarkets are available on Perhentian Islands and Redang Island, leaving only small grocery stores that primarily stock basic household necessities, limiting food choices for both villagers and businesses (Tharim et al., 2024). This limitation restricts food choices, necessitating frequent restocking from mainland suppliers.

Sourcing from the mainland is further complicated by logistical and transportation barriers. The surrounding water acts as a physical barrier, making transportation of goods by ferry or boat more challenging (Hilvano et al., 2022), thus highlighting poor transportation infrastructure on the islands (Adeoti et al., 2020; Hilvano et al., 2022; Tharim et al., 2024). During bad weather, travel becomes unsafe, isolating the island from food sources. Previous research by Tharim et al. (2024) mentioned that travels between the island and the mainland becomes hazardous during the rainy season due to rough ocean conditions, posing serious safety risks. In Malaysia, the monsoon season occurs at the end of the year, bringing strong winds and heavy rainfall. This seasonal phenomenon, lasting from November to March, impacts multiple Southeast Asian countries, including East India, South China, Myanmar, Thailand, Vietnam, Laos, Cambodia, Malaysia, Singapore, Indonesia, the Philippines Islands, and Borneo (Loo et al., 2015). The rough sea conditions force boat services to halt operations, causing tourism-related businesses, including resorts, to temporarily close. Such disasters negatively impact island economies, worsening food security by disrupting supply chains and limiting access to essential goods (Mohammadi et al., 2022).

Also, the geographical distance between small islands and the mainland leads to higher transportation costs, driven by expenses related to diesel, labour, and logistical services. For instance, rising diesel prices increase transport costs, driving up food prices, especially in rural and island communities reliant on imported supplies (Salim, 2021). United Nations Office for Project Services (UNOPS) noted that these elevated transportation costs negatively affect both imports and exports, restricting SID access to the markets and limiting the food supply chain (Adeoti et al., 2020).

Food security extends beyond mere access and affordability; food safety is also a key factor, particularly in small-scale food businesses where hygiene practices may be inconsistent. Safe and hygienic practices are important for effective food utilization, ensuring food remains high in quality, safe for consumption, and nutritionally adequate. Small-scale food businesses operating from home often lack the experience to adhere to food safety protocols (Limon, 2021). The quality and safety of food prepared in home kitchens are questionable due to insufficient knowledge and practices on food safety. Poor awareness among home-based food handlers can lead to foodborne illnesses from improper food handling (Mohamad Fauzi & Abdul-Mutalib, 2021). Since food can be mishandled consciously or unconsciously, training is needed for every food handler to lower the risk of foodborne illness outbreaks (Limon, 2021; Osaili et al., 2022).

2.3 Home-Based Café (HBC) in Rural Tourism Area

Home-based cafés (HBC) have emerged as an extension of the home-based food business sector, where food products are prepared in home kitchens on a small scale. Typically operated by families from their residences, HBCs provide a unique dining experience by utilizing domestic spaces for commercial purposes. Despite the growing presence of HBCs, limited research has been conducted on this concept, as it remains relatively underrecognized in the academic and business communities. Drawing parallels to the concept of a home restaurant, as described by Vösu and Kannike (2011), HBCs transform private residences into shared public spaces, offering an intimate and authentic dining experience. Similar to home restaurants, HBC operators often convert areas such as house porches or yards into customer dining spaces, blending home comfort with commercial food services.

The concept of HBC has been gaining popularity in Malaysia due to their low start-up costs and the flexibility in managing operations. Unlike conventional food and beverage (F&B) establishments, HBCs require minimal capital investment, making them an attractive option for individuals seeking alternative income sources (Razak et al., 2022). Their presence is evident in both urban and rural areas, catering to diverse market segments. However, as HBCs are typically located in residential rather than designated commercial zones, their visibility and accessibility remain limited. Consequently, social media and word-of-mouth marketing play a crucial role in business promotion, enabling HBC operators to attract customers despite their non-central locations.

In the context of small island destinations, HBC growth is driven by the tourism industry. Tourism provides a way to foster economic resilience by leveraging local culture, natural beauty, and culinary traditions. In destinations such as Perhentian Islands and Redang Island, HBCs serve as vital components of the local tourism infrastructure, as they often represent the primary dining options for tourists. Research indicates that businesses catering to tourists inherently function as tourism enterprises, falling within the category of community service businesses (Siemens, 2007). The reliance of island tourism on HBCs underscores their importance not only in providing food services but also in preserving and promoting local gastronomic traditions. Given the expanding role of HBCs in Malaysia's tourism and food sectors, further research is required to explore their economic sustainability, regulatory challenges, and potential contributions to local food security.

3.0 RESEARCH METHODOLOGY

In this study, Perhentian Islands and Redang Island, both gazetted as marine parks in Terengganu, have been chosen as sampling locations for this study. As marine protected areas (MPAs), these islands impose restrictions on human activities, potentially affecting food accessibility and raising concerns about the sustainability of food supply chains for HBC operators. Since fisheries are usually over-exploited, the government has taken action by establishing a marine park to facilitate sustainable fishing (Islam et al., 2014). Within these marine parks, "no-take zones" are enforced, prohibiting activities that could harm the marine ecosystem. While such measures contribute to ecological conservation, they also impose limitations on fisheries activities, thereby influencing local food procurement strategies.

A qualitative approach was adopted in exploring food security challenges and coping strategies among HBC operators on Perhentian Islands and Redang Island, Terengganu, Malaysia. In-depth semi-structured interviews with participants were carried out at their cafés during the fieldwork. A total of 17 HBC operators (1 male and 16 females) were recruited for this qualitative study. Semi-structured interviews were conducted between May to August 2024, focusing on unregulated and independent HBC settings on these small islands. Purposive sampling was applied by choosing the cafés managed individually at or near their homes

instead of cafés under hospitality organizations such as chalets and resorts, which were operated under more structured management systems. This approach allowed the researcher to explore the individual struggles among these HBC operators while restocking food supplies for their cafés on the islands, without any proper food service management system. Participants from diverse backgrounds, representing different genders, age groups, and educational backgrounds, were included to provide rich insight into this issue.

Using semi-structured interviews, the researcher examined how participants managed the procurement of raw material for the cafés, the challenges encountered, and the coping strategies employed in response to these constraints. The interview guideline was developed by the researcher based on past literature related to food security challenges (Mohammadi et al., 2022; Islam et al., 2014; Azman & Majid, 2023; Sharma, 2006; Razak et al., 2022; Abdullah et al., 2020; Fabeil et al., 2020) and was modified to suit the present study. It consisted of questions on what challenges they may encounter while supplying food ingredients from the mainland to their cafés on the islands, and how they secure their food supply chains and ensure reliable food resources despite all the challenges. The interview sessions were conducted in Malay (Bahasa Malaysia) to ensure participants felt comfortable and could express themselves more openly and meaningfully. As semi-structured interviews were open-ended and flexible, fixed questions did not have to be asked in order, and spontaneous questions might arise. All interviews were voice-recorded, transcribed, and translated verbatim into English. The transcripts were then analyzed to identify themes and codes.

The data were then analyzed using thematic analysis with ATLAS.ti software. A thematic analysis, a widely used approach in qualitative research, tends to be more oriented toward induction and deep analysis (Humble & Mozelius, 2022). It provides a structured yet flexible approach to identify and interpret key patterns in participants' experiences. Given the complexity of food supply chains in the SID setting, thematic analysis enables a systematic exploration of the challenges in accessing food resources. During the analysis, short and clear phrases were used as codes to capture key ideas from the data. These codes were subsequently organized into categories based on shared content or themes. By grouping similar codes, themes emerged, allowing a more structured understanding of the data obtained.

4.0 ANALYSIS AND DISCUSSION

This section discusses the key findings from the thematic analysis, focusing on the challenges and coping strategies related to food security among HBC operators on Perhentian Islands and Redang Island. Each theme reflects the life experiences of HBC operators and highlights their struggles with reliance on mainland goods, high living costs, monsoon season disruptions, and reliance on tourist visits. To address these issues, HBC operators have developed people-centered strategies, focusing on supply chain, operational, and financial management to adapt to these food security challenges.

4.1 Challenges of Food Security

This section addresses the study's first objective, that is to explore the food security challenges faced by HBC operators on Perhentian Islands and Redang Island. Based on the findings, four main themes that highlight barriers across the four pillars of food security were identified: (i) heavy reliance on mainland goods, (ii) expensive island living, (iii) restricted boat movement due to the monsoon season, and (iv) high dependency on tourism. These challenges reflect the complexity of food security in isolated small island environments.

4.1.1 Heavy Reliance on Mainland Goods

Perhentian Islands and Redang Island have designated zones for various purposes, including tourism, conservation, and infrastructure development, restricting potential sites for commercial establishments. With a small resident population, investors are often reluctant to build supermarkets due to low market demand, making the investments seem unprofitable. Hence, no supermarkets are available on either island, leaving them with a few small local grocery stores that offer only basic necessities. This has forced island communities to rely primarily on mainland goods, making it a common practice on small islands for years.

This dependency underscores vulnerabilities across the availability, accessibility, and stability dimensions of food security. The islands lack the infrastructure to support diverse and reliable food sources, making it difficult for HBC operators to access the necessary ingredients to maintain their menus. Although purchasing from the mainland provides access to a broader variety of products, often at lower bulk prices, the need for frequent restocking trips by boat or through intermediaries leads to logistical and financial burdens.

Seafood is one of the few items occasionally sourced locally. However, seafood is not as abundant as one might assume. Government-imposed fishing restrictions aimed at protecting marine biodiversity have led villagers to prioritize tourism over fishing activities. Participant 12 from Perhentian Islands mentioned that seafood was obtained locally whenever available. When local supply is insufficient, purchasing from the mainland becomes the only viable option to meet business needs.

“If there is seafood here, we will buy it locally. But if not, we will get it from the mainland.”

(Perhentian Participant 12)

Interestingly, this finding aligns with a past research by Hilvano et al. (2022), who reported that island villagers from Aguada, Darsena, Escarpada, and San Andres-Rasa-Medio Islands preferred travelling to Bulan, Sorsogon, to purchase and sell goods. This preference was driven by Bulan’s accessible transportation system and the broader range of available goods and services. These findings support the conclusion that island communities tend to rely on mainland food supplies to compensate for local limitations.

Overall, these challenges expose significant weaknesses in the availability, accessibility, and stability aspects of food security on islands, alongside critical deficiencies in infrastructure, investment, and local food production. Addressing these gaps is essential for building a more sustainable food system that supports both environmental protection and economic resilience in island communities.

4.1.2 Expensive Island Living

In addition to relying on mainland supplies, island-based HBC operators face the added burden of high operational costs, primarily driven by layered transportation expenses. This raises a concerning question: how do these rising costs emerge? Unlike in mainland settings, where food supplies are readily accessible, small island communities must make extra effort and spend more money to buy and transport goods. Transportation costs are a key determinant of overall operational expenses and pricing strategies for island-based businesses (Savic et al., 2020).

To travel across the sea, island communities must first pay for the boat fare, which is typically offered at a lower rate compared to outsiders. Upon reaching the mainland, they incur additional transportation costs, such as car rentals or e-hailing services, to access supermarkets or supplier shops, to obtain essential goods. To return to the island, they must pay again for the

return boat fare, along with the cost of transporting the goods back to the island. Past studies also highlighted similar issues, noting that the combination of limited access and high costs makes it more expensive to obtain basic services on islands compared to the more direct and affordable access available on the mainland (Spilanis et al., 2012; Karampela et al., 2014).

Notably, the cost and complexity of transporting goods differ between Perhentian Islands and Redang Island, influencing the overall financial burden on these HBC businesses. On Perhentian Islands, a goods transportation fee of RM10 is charged for each plastic bag of supplies. Once the goods arrive at the island jetty, HBC operators must manage the final step of transportation to their cafés. Due to the absence of proper roads on the island, transportation is restricted to motorcycles or electric scooters, which complicates the logistics and operations for operators.

“For the boat ride, it is RM10 for each plastic bag. If you have four bags, that would be RM40.”

(Perhentian participant 8)

On Redang Island, transportation costs account for 10% of the total value of goods purchased from the mainland. Similar to Perhentian, operators must also cover the cost of transporting goods from the jetty to their cafés. Yet, Redang Island benefits from a more developed infrastructure, with roads that accommodate lorries and vans, facilitating a more efficient supply chain. While the presence of structured transportation systems reduces logistical inefficiencies, it still imposes significant costs on business operations.

“The charge for the delivery is about 10%. Whether we spend RM1000 or RM2000, we will still be charged 10%.”

(Redang participant 1)

The multiple layers of cost and effort reflect weaknesses in the accessibility pillar, where food is available but difficult to access due to geographic and economic constraints. The situation is even more difficult for low-income HBC operators who operate without formal infrastructure, making them highly sensitive to price fluctuations in fuel or delivery rates. With prices significantly higher than on the mainland, business operators and villagers face unequal access to essential goods, reinforcing the need for structural interventions.

4.1.3 Monsoon Season Restricts Boat Movement

On Perhentian Islands and Redang Island, the monsoon season occurs from November to March, as reported by the Malaysian Meteorological Department. During this period, severe weather conditions such as heavy rain, strong winds, and high waves frequently disrupt boat services, the primary mode of transporting goods to these rural islands. As a result, the food supply chain is affected, causing island communities to struggle to maintain adequate stocks of fresh ingredients as travel to the mainland for restocking becomes impossible, severely weakening the stability pillar of food security.

This finding aligns with past studies, which discovered small islands that heavily rely on imported food were vulnerable to disruptions in the food distribution system caused by climate change and natural disasters (Teng, 2020). When transportation was cut off, islands faced periods of isolation, food shortages, supply insufficiencies, economic losses, and heightened food insecurity (Hilvano et al., 2022). The inability to transport essential goods not only affects food availability but also forces HBC operators to suspend operations due to adverse weather conditions and the sharp decline in tourist arrivals during the monsoon season.

“From April to September. We close in October because the boats cannot come, the waves are too strong.”

(Redang participant 2)

The seasonal closure is not merely a choice but a strategic decision essential for financial sustainability. High operational costs, including staff wages, utility bills, and the risk of food spoilage due to reduced business activity, make it impractical for HBCs to remain open during the monsoon season. Furthermore, with minimal tourist arrivals, operators struggle to cover fixed expenses such as rent and utilities, which continue to accumulate regardless of business performance. Therefore, many HBC operators find it more practical to temporarily close during this period to avoid further losses. Even when boats are available to access the mainland, the uncertain demand makes bulk purchasing risky, as unsold food stock may spoil. It reflects weakness in the stability pillar of food security, where seasonal weather leads to predictable yet unavoidable service interruptions.

“Because if we operate, we will face losses, the electric bill, and everything. No customers. We only rely on the villagers.”

(Redang participant 6)

This seasonal disruption highlights a weakness in the stability pillar of food security, where consistent access to food is compromised. The inability to ensure consistent food access, plan for supply, or manage seasonal risks weakens both the environmental and economic sustainability within small island food systems.

4.1.4 High Dependency on Tourism

Tourism plays a crucial role in sustaining the economies of island communities, with marine and coastal resources serving as socio-environmental and cultural assets that support local livelihoods (Sindico et al., 2020). However, during off-peak seasons or adverse weather conditions, tourist arrivals decline, resulting in reduced sales for HBC businesses. Given their heavy reliance on tourism, operators face challenges in generating sufficient revenue to cover operational costs and plan for future food ingredient purchases, as their primary customer base consists of visiting tourists. When tourism declines, income drops, but operational costs remain fixed. This strains business owners financially as they must also manage personal living expenses (Noor et al., 2022).

“During that time, there is absolutely no income. Just sit at home.”

(Redang participant 4)

Participant 4 from Redang noted that the monsoon season leaves operators without income, forcing them to stay at home instead of running their business. This illustrates that their income is highly seasonal, often resulting in prolonged periods of little to no earnings. The heavy reliance on tourism makes these businesses highly vulnerable to external disruptions, including economic downturns, public health crises such as COVID-19, and adverse weather conditions, all of which directly impact tourist inflows and threaten business sustainability. Therefore, heavy dependence on tourism is believed to weaken the stability of both food systems and the economy on the islands, as the businesses become highly seasonal. Without diversified income sources or safety nets, HBC operators remain vulnerable to disruptions that hinder consistent food supply and business.

4.2 Coping Strategies for Food Security

In island destinations, food security is shaped by socioeconomic conditions, environmental constraints, and logistical challenges. Given the unique vulnerabilities faced by HBC operators, their ability to sustain food availability and accessibility depends on people-centred coping strategies. Rather than relying solely on external interventions, community-driven solutions were developed. Based on the findings, three main themes were identified for the second objective of the study, which explores the coping strategies used by HBC operators to manage food security: (i) supply chain management, (ii) operational management, and (iii) financial management.

4.2.1 Supply Chain Management

The findings show that high transportation costs on Perhentian Islands and Redang Island primarily affect the food supply chain of HBC businesses. Hence, bulk purchasing has emerged as a practical strategy for managing food supplies and business continuity. As highlighted by Participant 8 from Perhentian Islands, sourcing goods in bulk from the mainland ensured a stable supply of ingredients over a longer period while mitigating the costs associated with frequent restocking trips. Minimizing the number of supply trips is a more convenient and cost-effective approach. This strategy not only enhances business sustainability but also improves the food availability pillar by ensuring a more stable food inventory.

“It is more cost-effective if we buy in bulk.”

(Perhentian participant 8)

Interestingly, the findings reveal that Perhentian Islands and Redang Island have already employed runner services to purchase goods from the mainland. This strategy is commonly employed by HBC operators, particularly during peak seasons when demand is high and time constraints prevent them from making supply trips themselves. Runners (individuals who purchase on their behalf) act as intermediaries, transporting goods from the mainland to the island, which allows operators to focus on managing their businesses without the added burden of frequent restocking. Although runner services involve additional costs, including delivery and service fees, they offer a practical and efficient solution for addressing logistical challenges. HBC operators can allocate more time for food preparation, customer service, and other essential business operations, which may improve efficiency and business sustainability.

“Most of the time, we buy through suppliers (runners). Because we do not have time to buy them on our own.”

(Redang participant 6)

The reliance on runner services highlights the importance of external support systems in maintaining food security for island-based businesses. Without reliable transportation methods, operators would struggle to meet the demands of tourists, potentially leading to lost revenue and customer dissatisfaction. Therefore, utilizing bulk purchasing and runner services helps strengthen the availability and stability pillars of food security by ensuring ingredients are consistently accessible despite logistical limitations.

4.2.2 Operational Management

While many operators rely on runner services for convenience, some find this method unreliable due to issues such as receiving incorrect items, poor-quality produce, or missing supplies. After experiencing multiple disappointments, these operators choose to personally

source their supplies from the mainland, allowing them to maintain stricter quality control over their ingredients. This hands-on approach ensures the freshness and brand-specific preference necessary to uphold the standards and identity of their cafés. For example, Participant 7 from Perhentian Islands preferred to personally purchase vegetables due to concerns about quality. By selecting high-quality produce directly, this operator could minimize spoilage and extend shelf life, reducing the frequency of restocking trips. Chevallier-Chantepie and Batt (2021) have emphasized that the personal beliefs of café operators significantly influence the adoption of sustainable practices.

“But for the vegetables, I like to pick them myself because I want good quality. Veggies these days come from Thailand, Malaysia, or China. Malaysian vegetables are the best. The ones from China go bad after three days, but Malaysian vegetables can last up to a month. Malaysian ones are pricier, but I care about quality. No point buying cheap if half of it is spoiled.”

(Perhentian participant 7)

From this finding, it can be concluded that this approach reinforces the utilization pillar of food security as they control the quality, freshness, and preferred brands of ingredients they want for their cafés.

4.2.3 Financial Management

The seasonal nature of tourism presents financial challenges for HBC operators during the monsoon season when tourist arrivals decline. Even with the decline in customer numbers, HBC operators still need to cover fixed costs like utility bills, making it more practical to close their businesses temporarily to minimize expenses. The majority of HBC operators save a portion of their earnings during peak seasons to sustain themselves during the monsoon season when tourist arrivals decline. While saving is a common strategy, the amount set aside varies based on individual income levels and business stability. Participant 1 from Perhentian Islands emphasized the necessity of accumulating sufficient savings to endure the months with little to no income. This financial coping strategy helps cover necessary expenses, such as needs, rent, and utility bills, during times when their income is low or non-existent, and avoids financial instability that may affect their accessibility to food.

“Exactly! Four months of rest. So, the money we make now needs to be saved for the end of the year.”

(Perhentian participant 1)

Meanwhile, some operators have decided to diversify business activities to generate income during slower months when fewer tourists visit the islands. Engaging in supplementary business activities helps reduce dependence on tourism, which remains volatile and seasonal. Hence, Participant 5 decided to sell traditional snacks or homemade dishes, often through online platforms. Unlike HBC operations that rely on dine-in customers, these businesses offer flexibility in order placement and delivery, typically utilizing cash-on-delivery (COD) or pre-arranged pick-up services.

“If there is any regular work that can be done, we will do it. Otherwise, we just stay at home. Or we might do some small businesses, like selling food online.”

(Perhentian participant 5)

This strategy strengthens the accessibility pillar of food security by ensuring operators to be able to afford essential needs even during income gaps. Moreover, it reflects economic sustainability, as saving during peak seasons and diversifying income help manage income volatility triggered by tourism seasonality.

5.0 CONCLUSION

This study highlights food security challenges and coping strategies employed by HBC operators in Terengganu's small islands, namely Perhentian Islands and Redang Island. Grounded in food security theory, this research reveals that the challenges in maintaining food security include heavy reliance on mainland supplies, high transportation costs, the monsoon season, and high dependence on tourism. The seasonal nature of tourism further intensifies these challenges, leading to business closures and inconsistent income. While operators employ coping mechanisms such as bulk purchasing, runner services, and business diversification, these strategies provide only short-term relief. The persistent reliance on external supplies and fluctuating tourism underscores the need for more sustainable solutions to ensure long-term food security and economic stability for HBC operators.

Several changes can be made to address these issues. First, improving infrastructure, such as establishing designated wholesale supply centers on the islands, can reduce reliance on the mainland. Second, encouraging local food production through modern farming initiatives can help diversify food sources and reduce reliance on mainland supplies. Third, financial literacy and business training programmes should be introduced to help HBC operators manage seasonal income fluctuations and improve the sustainability of the business. Government incentives to expand their storage facilities can help HBCs by allowing them to stockpile essential ingredients before the monsoon season. Finally, better integration of food security policies with marine park regulations can ensure that sustainable food supply practices align with environmental conservation efforts.

Implementing these improvements not only strengthens food security for HBC operators but also has broader implications for policy and sustainability. In this regard, this research contributes valuable insights for stakeholders and policymakers by extending the four pillars of food security theory to the small island context. These contributions align with the National Food Security Action Plan, providing actionable recommendations that strengthen food security while supporting economic and environmental goals within the HBC sector. Practically, the study underscores the importance of enhancing infrastructure, fostering local food production, and implementing policies to reduce reliance on external supplies. These insights can guide policy development and sustainable food tourism strategies in ecologically sensitive regions.

However, this study has several limitations. It focuses exclusively on HBC operators on Perhentian Islands and Redang Island, which may limit the generalizability of the findings to other small islands with different socio-economic contexts. Additionally, the qualitative approach provides in-depth insights but lacks the quantitative data needed to assess broader economic impacts. Future research should expand its scope to include more islands with diverse socio-economic conditions and integrate quantitative methods to assess the financial and operational impacts of food security challenges. Further exploration of the role of government policies and support systems can also provide valuable pathways to strengthen food security and foster economic resilience in small island communities. Addressing these gaps will contribute to a more comprehensive understanding of food security in isolated island ecosystems.

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REFERENCES

- Abdullah, R. G., Mersat, N. I., & Wong, S. K. (2020). Implications of the COVID-19 pandemic on household food security: Experience from Sarawak, Malaysia. *International Journal of Business and Society*, 22(1), 1-13.
- Aborisade, B., & Bach, C. (2014). Assessing the pillars of sustainable food security. *European International Journal of Science and Technology*, 3(4), 117-125.
- Adeoti, T., Fantini, C., Morgan, G., Thacker, S., Ceppi, P., Bhikhoo, N., Kumar, S., Crosskey, S., & O'Regan, N. (2020). *Infrastructure for small island developing states. The role of infrastructure in enabling sustainable, resilient, and inclusive development in SIDS*. UNOPS. https://content.unops.org/publications/Infrastructure_SIDS_EN.pdf
- Andress, L., & Fitch, C. (2016). Juggling the five dimensions of food access: Perceptions of rural low-income villagers. *Appetite*, 105, 151-155.
- Ayaviri-Nina, V. D., Quispe-Fernández, G. M., Vanegas, J. L., Ortega-Mejía, V., & Cordero-Ahiman, O. V. (2022). Importance of purchasing power and education in the food security of families in rural areas—case study: Chambo, Ecuador. *Sustainability*, 14(10), 1-11.
- Azman, A. B., & Majid, M. A. A. (2023). Role of family and survival strategies of micro-family food business during the COVID-19 pandemic. *Journal of Tourism and Services*, 14(26), 153-172.
- Burchi, F., & De Muro, P. (2016). From food availability to nutritional capabilities: Advancing food security analysis. *Food Policy*, 60, 10-19.
- Chevallier-Chantepie, A., & Batt, P. J. (2021). Sustainable purchasing of fresh food by restaurants and cafés in France. *Agronomy*, 11(11), 1-13.
- Chew, B. (2020). *Redang Island facilities & services*. HolidayGoGoGo. <https://www.holidaygogogo.com/redang-island-facilities-services/>
- FAO. (2006). *Food security*. Food and Agriculture Organization of the United Nations. https://www.fao.org/fileadmin/templates/faoitally/documents/pdf/pdf_Food_Security_Concept_Note.pdf
- FAO. (2008). *An introduction to the basic concepts of food security*. FAO Food Security Programme. <https://www.fao.org/agrifood-economics/publications/detail/en/c/122386/>
- Fabeil, N. F., Pazim, K. H., & Langgat, J. (2020). The impact of the COVID-19 pandemic crisis on micro-enterprises: Entrepreneurs' perspective on business continuity and recovery strategy. *Journal of Economics and Business*, 3(2), 837-844.
- Ghalibaf, M. B., Gholami, M., & Mohammadian, N. (2022). Stability of food security in Iran; Challenges and ways forward: A narrative review. *Iranian Journal of Public Health*, 51(12), 2654–2663.
- Gibson, M. (2012). Food security—a commentary: What is it and why is it so complicated? *Foods*, 1(1), 18-27.
- Hilvano, N. F., Bantayan, N. C., Pulhin, J. M., Nelson, G. L. M., & Arboleda, M. D. M. (2022). Small island spatial accessibility: The case of San Vicente, Northern Samar, Philippines. *Journal of Marine and Island Cultures*, 11, 22-41.
- Humble, N., & Mozelius, P. (2022). Content analysis or thematic analysis: Doctoral students' perceptions of similarities and differences. *Electronic Journal of Business Research Methods*, 20(3), 89-98.

- Islam, G. M. N., Yew, T. S., Noh, K. M., & Noh, A. F. M. (2014). Community's perspectives towards the marine protected area in Perhentian Marine Park, Malaysia. *Open Journal of Marine Science*, 4, 51-60.
- Limon, M. R. (2021). Food safety practices of food handlers at home engaged in online food businesses during the COVID-19 pandemic in the Philippines. *Current Research in Food Science*, 4, 63-73.
- Karampela, S., Kizos, T., & Spilanis, I. (2014). Accessibility of islands: Towards a new geography based on transportation modes and choices. *Island Studies Journal*, 9(2), 293-306.
- Loo, Y. Y., Billa, L., & Singh, A. (2015). Effect of climate change on seasonal monsoon in Asia and its impact on the variability of monsoon rainfall in Southeast Asia. *Geoscience Frontiers*, 6(6), 817-823.
- Lowitt, K., Ville, A. S., Lewis, P., & Hickey, G. M. (2015). Environmental change and food security: The special case of small island developing states. *Regional Environmental Change*, 15, 1293-1298.
- Mohamad Fauzi, F. J., & Abdul-Mutalib, N. A. (2021). Knowledge and practice of home-based food handlers in Hulu Selangor, Malaysia regarding food safety. *Biology and Life Sciences Forum*, 6(1), 1-6.
- Mohammadi, E., Singh, S. J., McCordic, C., & Pittman, J. (2022). Food security challenges and options in the Caribbean: Insights from a scoping review. *Anthropocene Science*, 1(1), 91-108.
- Mohd Nor, M. H. (2023, February 21). Why food security is more important now. *The Star*. <https://www.thestar.com.my/business/business-news/2023/02/21/why-food-security-is-more-important-now>
- Newberry, R., & Bosworth, G. (2010). Home-based business sectors in the rural economy. *Society and Business Review*, 5(2), 183-197.
- Noor, N. M., Zain, N. M., & Zain, M. H. M. (2022). The local community perception of the impacts of tourism on the economy in Pangkor Island, Malaysia. *Malaysian Journal of Tropical Geography*, 48(1), 1-18.
- Osaili, T. M., Al-Nabulsi, A. A., & Al-Jaberi, T. M. (2022). Food safety knowledge, attitudes, and practices among female food handlers engaged in home-based online food businesses in Jordan during the COVID-19 pandemic. *Heliyon*, 8(8), e10427.
- Rajendran, S. D. (2023, November 11). Enhancing Malaysia's commitment to food security. *Business Today*. <https://www.businesstoday.com.my/2023/11/11/enhancing-malaysias-commitment-to-food-security/>
- Rajendran, S. D. (2025, January 16). Food security in the face of climate change. *Malaysia Gazette*. <https://malaysiagazette.com/2025/01/16/food-security-in-the-face-of-climate-change/>
- Razak, S. S. A., Tuan, L. Y., & Lau, T. C. (2022). Food safety legal issues in home-based food business. *International Journal of Academic Research in Business and Social Sciences*, 12(1), 2600–2610.
- Sadati, A. K., Nayedar, M., Zartash, L., & Falakodin, Z. (2021). Challenges for food security and safety: A qualitative study in an agriculture supply chain company in Iran. *Agriculture & Food Security*, 10, 1-7.
- Salim, Z. (2021, September 19). Penduduk Pulau Redang rayu subsidi LPG. *Harian Metro*. <https://www.hmetro.com.my/mutakhir/2021/09/756780/penduduk-pulau-redang-rayu-subsidi-lpg>
- Savić, B., Petrović, M., & Vasiljević, Z. (2020). The impact of transportation costs on economic performance in crop production. *Economics of Agriculture*, 67(3), 683-697.

- Sharma, K. L. (2006). Food security in the South Pacific Island countries with special reference to the Fiji Islands. In B. Davis (Ed.), *Food insecurity, vulnerability, and human rights failure* (pp. 35-57). Palgrave Macmillan.
- Siemens, L. (2007). Challenges faced by rural/remote tourism businesses on Vancouver Island: An exploratory study. *Journal of Enterprising Communities: People and Places in the Global Economy*, 1(4), 308-320.
- Sindico, F., Sajeve, G., Sharman, N., Berlouis, P., & Ellsmoor, J. (2020). *Islands and COVID-19: A global survey*. Pure Portal. <https://pureportal.strath.ac.uk/en/publications/islands-and-covid-19-a-global-survey>
- Spilanis, I., Kizos, T., & Petsioti, P. (2012). Accessibility of peripheral regions: Evidence from Aegean Islands (Greece). *Island Studies Journal*, 7(2), 199-214.
- Sulaiman, N., Yeatman, H., Russell, J., & Law, L. S. (2021). A food insecurity systematic review: Experience from Malaysia. *Nutrients*, 13(3), 1-39.
- Surendran, S. (2021, January 11). Surviving the impact of COVID-19: A trying year for jobholders. *The Edge Malaysia*. <https://theedgemalaysia.com/article/surviving-impact-covid19-trying-year-job-holders>
- Teng, P. (2020). Assuring food security in Singapore, a small island state facing COVID-19. *Food security*, 12(4), 801-804.
- Tharim, A. H. A., Sayuthy, A. I. A., & Wahi, N. (2024). An assessment on the impact of physical development of Perhentian Island, Terengganu, Malaysia, toward the quality of life of its residents. *Planning Malaysia*, 22(2), 428-441.
- Tortajada, C., & Lim, N. S. W. (2021). Food security and COVID-19: Impacts and resilience in Singapore. *Frontiers in Sustainable Food Systems*, 5, Article 740780.
- Võsu, E., & Kannike, A. (2011). My home is my stage: Restaurant experiences in two Estonian lifestyle enterprises. *Journal of Ethnology and Folkloristics*, 5(2), 19-47.