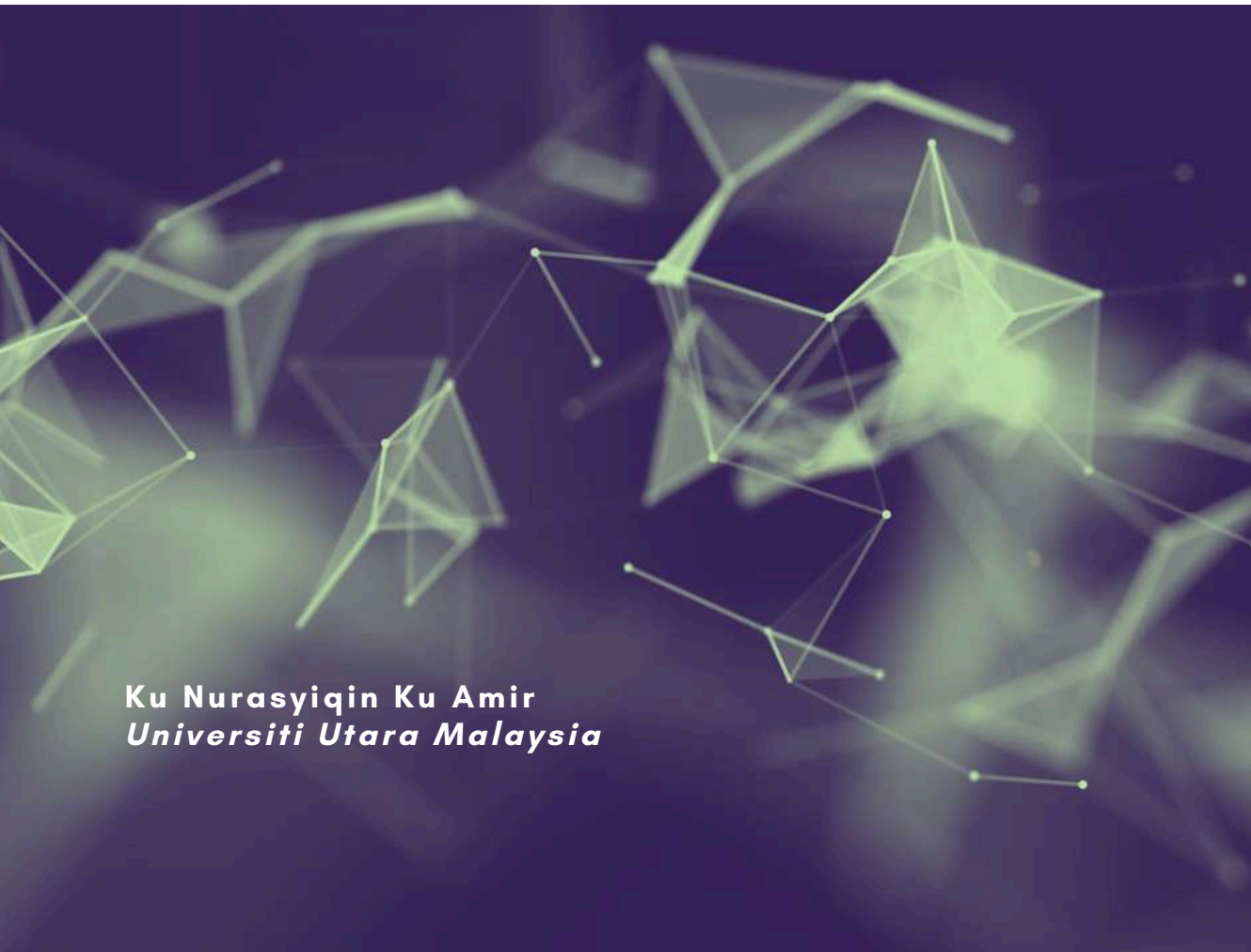
APPGM-SDG Case Study Small Grants for Young Researchers Programme

PADI HUMA AND PADI ORGANIK IN SIK, KEDAH: A CASE STUDY IN FOOD SOVEREIGNTY AND BOTTOM-UP FOOD SECURITY



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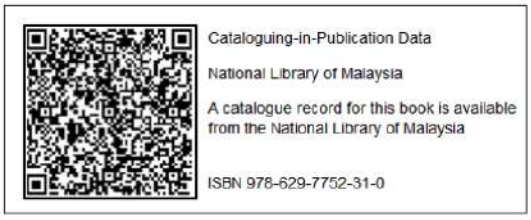

The APPGM-SDG Case Study Small Grants for Young Researchers Programme empowers researchers under 35 to conduct qualitative research on pressing SDG-related issues in Malaysia. The resulting papers explore challenges affecting left-behind communities, directly supporting APPGM-SDG's grounded, evidence-based research agenda. The grant is offered and managed by APPGM-SDG's policy think tank, MySDG Centre for Social Inclusion.

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Padi Huma and Padi Organik in Sik, Kedah: A Case Study in Food Sovereignty and Bottom-Up Food Security

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ABSTRACT

Malaysia's rice sector faces a structural tension between yield-centered national policies and rural realities of economic precarity and ecological decline. This study argues that food sovereignty, practiced through *padi huma* (traditional upland rice) and organic System of Rice Intensification (SRI) in Sik, Kedah, extends food security by integrating human security dimensions. Using qualitative fieldwork in August 2025 and the UNDP human security framework, the research examines how smallholders operationalise sovereignty. Findings identify three core mechanisms: operational autonomy, ecological integrity, and social resilience through *gotong-royong* (collective labour). These practices enable premium pricing and soil regeneration while rebuilding social dignity. Despite successes, systemic barriers (including chemical-centric policy bias and restrictive seed regulations) hinder progress. However, partnerships like the *Lembaga Zakat Negeri Kedah*'s Smart SBBA programme illustrate the potential for hybrid models that combine state resources with grassroots autonomy. The study concludes that food sovereignty is a governance strategy that bridges technical production metrics with human security. Policy reform must redirect subsidies towards organic systems and institutionalise participatory governance. Aligning these shifts with SDGs 2 and 12 will embed autonomy and sustainability into Malaysia's agricultural future.

Keywords: Food Sovereignty; Food Security; Human Security; Bottom-up Approach; Agriculture policy

INTRODUCTION

Malaysia's rice sector exemplifies a fundamental tension between national food security imperatives and rural human security outcomes, a tension that alternative farming models in Sik, Kedah, are actively resolving through food sovereignty practices. The country's persistent rice import dependency, with self-sufficiency rates hovering around 70%, represents not merely a trade deficit but a multidimensional security challenge affecting ecological sustainability, rural livelihoods, and cultural continuity. While national policy continues to privilege industrial agriculture through heavy subsidisation and technological intensification, this approach has paradoxically deepened vulnerabilities: environmental degradation from chemical inputs, farmer dependency on state support, and the erosion of traditional ecological knowledge.

This study argues that food sovereignty, as practiced through *padi huma* (traditional upland rice) and *padi organik* (organic rice under the System of Rice Intensification), offers a necessary extension of food security that addresses its human security dimensions**.** Drawing on fieldwork in Kampung Gulau and Kampung Belantik, the research demonstrates how smallholder farmers and community leaders operationalise food sovereignty through concrete practices: maintaining seed autonomy, fostering collective labour systems (*gotong-royong*), and achieving market independence despite systemic constraints. These bottom-up innovations challenge the structural vulnerabilities of Malaysia's conventional rice sector while providing empirically grounded alternatives for sustainable food system transformation.

The human security framework, as developed by the United Nations Development Programme (UNDP, 1994), provides the analytical lens for understanding how food sovereignty transcends narrow

productionist approaches to food security. Human security emphasises freedom from want and freedom from fear across seven dimensions—economic, food, health, environmental, personal, community, and political security (United Nations, 1994). In the Malaysian context, where smallholder farmers face market volatility, policy neglect, and ecological degradation, achieving food security through industrial intensification alone fails to address these interconnected vulnerabilities. The cases examined here reveal how food sovereignty practices simultaneously enhance multiple security dimensions: economic security through premium market prices, environmental security through pesticide-free cultivation, community security through reciprocal labour arrangements, and personal security through the restoration of farmer dignity and autonomy.

The significance of the Sik case extends beyond local innovation to challenge dominant assumptions in Malaysian agricultural policy. By demonstrating viable alternatives to chemical-dependent, subsidy-reliant rice production, these communities provide concrete evidence for policy reform aligned with Sustainable Development Goals 2 (Zero Hunger) and 12 (Responsible Consumption and Production). The study's findings are particularly relevant given Malaysia's commitment to achieving developed nation status while ensuring food security for its population. The integration of traditional knowledge with modern ecological practices, as seen in both the *padi huma* and SRI models, suggests pathways for agricultural development that are simultaneously productive, sustainable, and culturally appropriate.

This research contributes to three critical gaps in the literature and policy discourse. First, it provides empirical documentation of food sovereignty as lived practice rather than abstract principle, demonstrating how Malaysian farmers translate sovereignty concepts into daily agricultural operations. Second, it analyses the complex

relationship between state institutions and community initiatives, revealing both synergies and tensions in bottom-up food system transformation.

Third, it bridges the conceptual divide between food security and human security, showing how sovereignty practices address multiple dimensions of human wellbeing beyond caloric availability. Through this analysis, the study argues that food sovereignty should not be viewed as an alternative to, but rather as the logical extension and deepening of, food security within a human security paradigm.

Conceptual Framework: Food Sovereignty as Human Security in Practice

The evolution from food security to food sovereignty represents a paradigmatic shift from measuring success through production metrics to evaluating food systems through their contribution to human security. Food security, as defined by the Food and Agriculture Organisation (FAO, 1996), focuses on ensuring "all people, at all times, have physical and economic access to sufficient, safe, and nutritious food." While this framework has guided decades of agricultural policy, its technical orientation obscures power relations and structural inequalities (Lima et al., 2021; Reisman & Fairbairn, 2021). Food security treats food as a commodity to be produced and distributed efficiently, assuming market mechanisms will ensure universal access. This approach, however, fails to address who controls production, how ecological systems are affected, and whether local communities maintain autonomy over their food systems (Koc, 2015).

Food sovereignty emerges as both critique and extension of food security, embedding it within broader struggles for autonomy, ecological integrity, and social justice. First articulated by La Vía Campesina at the 1996 World Food Summit, food sovereignty asserts

peoples' right to define their own food and agriculture systems. Unlike food security's focus on availability and access, food sovereignty addresses the power relations shaping food systems—demanding democratisation of production, protection of local knowledge, and ecological stewardship. The framework's six pillars which are food for people, valuing food providers, localising food systems, local control, building knowledge, and working with nature, provide operational principles for transforming food systems from below (Edelman, 2014; Patel, 2009).

The human security paradigm provides the analytical bridge between food security's technical focus and food sovereignty's transformative agenda. Human security, as conceptualised by the UNDP, expands security beyond state concerns to encompass individual and community wellbeing across seven dimensions. This multidimensional approach reveals how food insecurity intersects with other vulnerabilities such as economic marginalisation, environmental degradation, social exclusion, and political disempowerment. In agricultural contexts, human security requires not just food availability but also economic dignity, ecological sustainability, community cohesion, and personal autonomy.

This study operationalises the relationship between food security, food sovereignty, and human security through three analytical dimensions:

DIMENSION	FOOD SECURITY FOCUS	FOOD SOVEREIGNTY PRACTICE	HUMAN SECURITY OUTCOME
Ecological Sustainability	Yield maximisation through inputs	Agroecological methods, biodiversity	Environmental security, long-term resilience
Economic Autonomy	Market access, price stability	Producer control over prices, markets	Economic security, freedom from dependency
Social Organisation	Individual production units	Collective labour, knowledge sharing	Community security, cultural continuity

The Malaysian context provides a critical test case for this framework, given the country's dual challenge of ensuring national food security while protecting smallholder livelihoods. Malaysia's rice sector exemplifies the contradictions of conventional food security approaches: despite decades of Green Revolution policies, the country remains import-dependent while smallholder farmers face mounting economic and ecological pressures. The persistence of poverty among paddy farmers, even with substantial government subsidies, suggests that technical solutions alone cannot achieve genuine food security.

This study examines how food sovereignty practices in Sik, Kedah, address these limitations by rebuilding food systems from the ground up, prioritising human security outcomes over abstract productivity targets.

Case Study Sites and Focus

This case study on food sovereignty and alternative paddy farming primarily focuses on two distinct ecological and operational models within the Sik district of Kedah. These sites were chosen to analyse the practical execution of food sovereignty principles against the backdrop of declining productivity in mainstream Malaysian agriculture.

The first model investigated is the cultivation of padi huma, focusing on the community practices in Kampung Gulau to represent a traditional, communal approach. During fieldwork, we identified several individuals as pioneers in rejuvenating the padi huma tradition, particularly in several villages within Sik. Their role is critical because this agricultural practice is gradually vanishing due to internal migration and urbanization, leaving the elderly to continue the work.

The operational focus here is on traditional ecological knowledge that emphasises rainfall dependency, low water usage, and *gotong-royong* (a labor management practice through communal reciprocal rotation). This rotational system is defined by farmers collectively working on paddy fields in sequence; labor-intensive tasks like planting and harvesting are done collectively, ensuring collective completion of work across all farmers' lands on a rotating schedule. This study documents the diverse variety of paddy seeds used (eleven types, including Bario, padi hitam (black rice), and *pulut hitam* (black glutinous rice), the significant involvement of women, and the direct market autonomy achieved by selling high-value *beras padi huma* (*padi huma* rice) (RM25-RM30/kg), where demand exceeds supply.

Figure 1. Yusof Ismail's *padi huma*

In Figure 1, Yusof Ismail proudly showing his *padi huma* plot in front of his home, where the stalks of *padi hitam* grow fully *bernas* (grain-filled). The thriving crop illustrates the success of traditional seed varieties and the vitality of community-based upland rice farming in Sik, Kedah. The second key site examines the *padi organik* (organic paddy) model, specifically at SRI Lovely, managed by Zakaria Kamantasha and located in the remote area of Kampung Belantik. The operational focus at SRI Lovely is on ecological integrity, guided by religious principles (with reference to the *Al-Quran*). The project aims to prove that organic farming can achieve results comparable to conventional methods, yielding five or six tons per season. Zakaria's method is highly coordinated and centres on input autonomy, achieved by producing all inputs independently and designing the ecological system for natural pest control. This site, which is naturally irrigated by water

streams, also practices seed preservation, specifically maintaining high-value varieties like Red Ruby Rice.

This site allows for the analysis of food sovereignty as a coordinated, ecologically rigorous counter-movement, emphasising its high market value (organic rice selling for RM18/kg) and its reliance on small-scale technology and manual techniques (Sustainable Rice Intensification). The comparison between the community-led padi huma in Kampung Gulau and the coordinated SRI Lovely in Kampung Belantik provides a central analytical contrast regarding the degrees of autonomy, technology use, and sustainability challenges faced by alternative food movements in Kedah. This comparative analysis elucidates the nuanced interplay between traditional knowledge systems and innovative organic practices in fostering resilient, localised food systems in the region.

The Relevance of Sik, Kedah, as a Case Study Site

While food sovereignty offers a global framework of resistance, its effectiveness must be examined through localised praxis. The specific problem addressed by this study is the need to investigate how bottom-up approaches can successfully translate the radical principles of food sovereignty into tangible realities, thereby mitigating the crises imposed by the global food regime in a localised context.

Sik, Kedah, a region characterised by its agricultural roots and home to both traditional and alternative farming practices, provides a crucial analytical site. The case study focuses on two distinct, bottom-up models of resistance: the traditional, communal *padi huma* model, largely observed through the pioneering practices in Kampung Gulau, and the highly coordinated *padi organik* system in Kampung Belantik. These models demonstrate a practical rejection of chemical

dependency by farming without pesticides and 'without chemicals' (Zainoodin Isa, 2025). The assertion of food sovereignty, achieved through demand-driven pricing (up to RM40 per kilo) and actively resisting corporate control over seeds, makes Sik an ideal location to analyse the economic and political viability of localized food systems.

Furthermore, the study of Sik is relevant due to the active, yet complex, involvement of the state government through the Kedah State Zakat Board or *Lembaga Zakat Negeri Kedah* (LZNK). LZNK's *Smart Sawah Berskala Besar Asnaf* (SBBA) programme aims to transform *asnaf* (aid recipients) into *zakat* payers who can build resilience and survive on their own. This dynamic allows the research to examine the inevitable friction between local, autonomous food sovereignty movements and the political realities of a centralised, developmental, and religiously informed state.

Research Objectives and Questions

This study examines how alternative paddy farming models in Sik, Kedah, *padi huma* and *padi organik* translate food sovereignty from principle into practice as an extension of food security that advances human security. The first objective is to analyse how *padi huma* and *padi organik* systems operationalise food sovereignty through mechanisms that enhance multiple human security dimensions. The second objective is to identify structural barriers that limit the wider adoption of food sovereignty practices. The third objective is to examine how hybrid governance models enable productive state–community collaboration.

These objectives are guided by three research questions:

1. How do alternative farming practices translate abstract food sovereignty principles into mechanisms that enhance human security?

2. What policy, legal, and institutional barriers constrain the scaling of food sovereignty initiatives, and how do these reflect broader political-economic structures?
3. Under what conditions can state institutions support food sovereignty without undermining community autonomy, and what governance innovations make this possible?

LITERATURE REVIEW: THE GLOBAL FOOD SYSTEM AND THE IMPERATIVE OF ALTERNATIVE AGRICULTURE

The Crisis of the Neoliberal Food Regime

The contemporary global food system, structured by neoliberal market logic and corporate control, systematically undermines both food security and human security through processes of dispossession, dependency, and ecological destruction. The food regime framework, as theorised by McMichael and Friedmann, reveals how agricultural production has been reorganised to serve global capital rather than local needs (Burch & Lawrence, 2009; Campbell, 2009). This transformation redefines food as a tradable commodity, subject to speculation and manipulation, while marginalising its social, cultural, and ecological dimensions (Friedmann, 2016). In Malaysia, integration into global food chains has created a dual crisis: national dependency on food imports threatening sovereignty, and smallholder marginalisation undermining rural human security (Wong et al., 2024).

Industrial agriculture's promise of food security through technological intensification has produced paradoxical outcomes—increased production alongside persistent hunger, ecological degradation, and farmer impoverishment. The Green Revolution, celebrated for boosting yields, exemplifies these contradictions. As Shiva (1991) documents in *The Violence of the Green Revolution*, technological packages of hybrid seeds, chemical fertilisers, and pesticides created new forms of dependency while destroying traditional agricultural

systems. In the Malaysian context, paddy farmers' continued poverty despite yield improvements and heavy subsidisation reveals the inadequacy of productionist approaches. The focus on quantity obscures quality issues—nutritional value, ecological sustainability, and social equity—that determine genuine food security.

Food Sovereignty as Counter-Hegemonic Framework

Food sovereignty emerged in the mid-1990s as a response to the failures of neoliberal food security, led by the global peasant movement La Via Campesina, which defined the term in 1993. It challenges the neoliberal food system that prioritises market efficiency and corporate interests by advocating democratic control over food resources, production, and policies at local, national, and global levels (Mares & Alkon, 2012; Patel, 2009). Unlike neoliberal food security's focus on market availability, food sovereignty promotes rights-based approaches, local autonomy, agroecology, and social justice, including gender equity. Rooted in resistance to the corporate food regime shaped by deregulation, free trade, and agribusiness dominance, it calls for agrarian reform, protection of peasant rights, and community-based food systems that reclaim power from multinational corporations and global institutions (Holt Giménez & Shattuck, 2011). By reframing food as a right rather than a commodity, food sovereignty seeks to transform food governance, ensure equitable and sustainable outcomes, and strengthen international recognition of peasants' rights and agroecological practices as viable alternatives to industrial agriculture.

Empirical studies of food sovereignty reveal diverse pathways for translating principles into practice, demonstrating viability across different ecological and political contexts. The MASIPAG network in the Philippines exemplifies farmer-led research and seed conservation, enabling escape from corporate dependency (Borras et

al., 2008). Cuban urban agriculture demonstrates rapid transition to agroecological production under crisis conditions (Gürcan, 2014). Brazil's Zero Hunger programme shows how food sovereignty principles can inform national policy (Wittman & Blesh, 2017). These cases reveal common elements: restoration of local knowledge, collective organisation, ecological methods, and resistance to corporate control. Yet they also show contextual variation, suggesting food sovereignty manifests differently according to local conditions, histories, and possibilities.

The Malaysian Context: Policy Contradictions and Alternative Pathways

Malaysia's agricultural policy exemplifies the contradictions between food security rhetoric and neoliberal practice, creating spaces for alternative models to emerge from below. National policy continues to privilege industrial agriculture through subsidisation of chemical inputs, promotion of high-yielding varieties, and emphasis on economies of scale. The National Agrofood Policy targets food security through production increases and import substitution, yet fails to address structural issues—land concentration, market volatility, ecological degradation—affecting smallholders. This policy framework, while claiming to support farmers, actually deepens their dependency through input subsidies that benefit agribusiness more than producers.

The persistence of traditional and alternative farming systems in Malaysia, despite policy neglect, demonstrates grassroots innovation and resistance to industrial homogenisation. Communities maintaining *padi huma* cultivation preserve not just rice varieties but entire knowledge systems encompassing ecological management, social organisation, and cultural practice. Organic farming initiatives, though marginal in policy terms, show growing momentum as farmers

seek escape from chemical dependency and market volatility. These alternatives operate largely outside official support systems, relying on community networks, informal markets, and traditional institutions. Their persistence suggests inherent limitations in industrial models and continuing relevance of place-based, ecologically adapted agriculture.

METHODOLOGY: COMPARATIVE CASE STUDY DESIGN

Research Approach and Site Selection

This study employs a qualitative comparative case study methodology to examine how food sovereignty manifests through two distinct agricultural models in Sik, Kedah, providing empirical evidence for bottom-up food system transformation. The research design facilitates analysis of both commonalities and variations in food sovereignty practice, examining how different communities translate shared principles into contextually appropriate strategies. Sik district was selected as the research site for three reasons: (1) its concentration of alternative farming practices operating outside conventional support systems; (2) the presence of both traditional (*padi huma*) and modern ecological (organic SRI) approaches; and (3) active state-community engagement through the LZNK, providing insight into institutional dynamics of food sovereignty.

The comparative framework examines two contrasting yet complementary models of food sovereignty, each representing different pathways toward agricultural autonomy and ecological sustainability. The first case focuses on *padi huma* cultivation in Kampung Gulau, where traditional upland rice farming persists through community knowledge and collective labour. The second examines the SRI Lovely organic project in Kampung Belantik, where systematic ecological design achieves high productivity without chemical inputs. This comparison illuminates how food sovereignty

principles through seed autonomy, ecological methods, local control, translate into practice through different organisational forms and knowledge systems.

Data Collection Methods

Primary data collection integrated multiple qualitative methods to capture both practices and meanings of food sovereignty, conducted through intensive fieldwork between August and September 2025. Semi-structured interviews with key informants—including pioneer farmers (Yusof Ismail, Zainoodin Isa), project coordinators (Zakaria Kamantasha), and institutional representatives (LZNK and Department of Agriculture [DOA] officials)—explored motivations, challenges, and strategies for alternative agriculture. Participant observation during critical agricultural activities, particularly *menajuk* (seed sowing) and *gotong-royong* sessions, provided insight into collective labour organisation and knowledge transmission. Field documentation captured ecological practices, seed varieties, and technological adaptations, while informal conversations revealed everyday politics of food sovereignty.

The research adopted a participatory approach recognising farmers as knowledge producers rather than research subjects, facilitating collaborative analysis of food system transformation. This methodological stance aligns with food sovereignty principles of valuing local knowledge and farmer agency. Farmers actively interpreted their practices in relation to broader political-economic contexts, providing critical analysis of policy constraints and market dynamics. Community members validated preliminary findings through feedback sessions, ensuring accurate representation of their perspectives and practices. This participatory dimension strengthened analytical depth while respecting community ownership of knowledge.

Analytical Framework

Data analysis employed thematic coding structured around three dimensions of food sovereignty as human security practice: autonomy, resilience, and transformation. The autonomy dimension examined how farmers achieve control over seeds, inputs, knowledge, and markets. The resilience dimension analysed ecological practices, social organisation, and economic strategies that reduce vulnerability. The transformation dimension explored how alternative practices challenge dominant systems and create new possibilities. This framework enabled systematic comparison across cases while maintaining sensitivity to contextual specificities (Yin, 2018).

The human security lens guided assessment of outcomes beyond conventional agricultural metrics, examining multiple dimensions of wellbeing and empowerment (Nishikawa, 2010). Analysis evaluated how alternative farming practices address: economic security (income stability, market access); food security (availability, quality, cultural appropriateness); environmental security (ecological sustainability, climate adaptation); community security (social cohesion, collective action); and personal security (dignity, autonomy, identity). This multidimensional assessment reveals how food sovereignty practices generate comprehensive security outcomes unavailable through industrial agriculture.

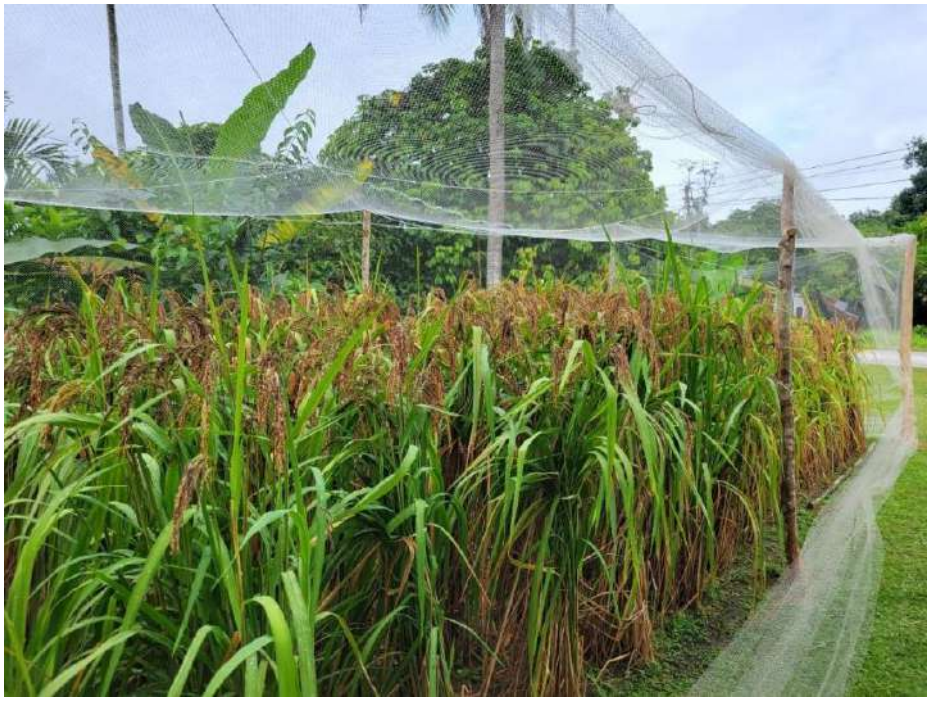
Case Study Descriptions

Case 1: Padi Huma - Sustaining Local Ecological Knowledge

The first case study centred on *padi huma* cultivation in Kampung Gulau, representing a traditional, community-based form of food sovereignty deeply rooted in local ecological knowledge. Fieldwork revealed that *padi huma* relies on rainfall and is vulnerable to climatic variability, yet it maintains high social resilience through communal labor traditions such as gotong-royong. Key informants included Yusof

Ismail and Zainoodin Isa, regarded as pioneers who continue to preserve and transmit this knowledge, and Kak Yah, whose active participation highlights the crucial role of women in sustaining local farming culture.

Figure 2. A demonstration plot of *padi huma*



In Figure 2, a demonstration plot of *padi huma* grown in front of Yusof Ismail's house, showcasing a tall local variety reaching about five feet. The grain is visibly *bernas* (well-filled), reflecting the vitality and adaptability of traditional upland rice cultivation in Sik, Kedah.

Case 2: Padi Organik - Systemic Ecological Innovation

The second case focused on the SRI Lovely padi organik project in Kampung Belantik, which offered a contrasting yet complementary model to padi huma. Situated in a remote area beyond conventional jelapang (rice granary) regions, SRI Lovely is managed with a high

degree of coordination and ideological commitment under the leadership of Kapten Zakaria Kamantasha. Unlike padi huma, which depends on varietal diversity and natural rainfall, this initiative applies ecological principles from the System of Rice Intensification (SRI) to achieve high productivity, reportedly up to five or six tons per acre, without chemical inputs. Critically, just like padi huma, the SRI Lovely project also practices seed preservation, focusing on maintaining the genetic integrity of specialized varieties, such as Red Ruby Rice, to secure their input autonomy and market distinction.

Guided by the Islamic ecological philosophy of *rahmatan lil alamin* (Mercy to all the worlds), SRI Lovely treats agriculture as an integrated "ecology system" designed to achieve input autonomy and long-term soil health. While the *padi organik* yields are significantly higher than those of padi huma (1.5-2 tons per acre), the project still maintains small-scale manual techniques and strong community engagement. Crucially, this engagement extends globally, as Kapten Zakaria hosts communities, academics, and international students who visit SRI Lovely to learn the organic System of Rice Intensification (SRI) method, often staying for weeks or months. This practice transforms the site into a recognised learning hub and reinforces the project's ecological rationalisation. The comparison between these two cases highlights two different modes of innovation: one rooted in heritage and communal adaptation (*padi huma*), and the other in ecological rationalisation, spiritual motivation, and global knowledge exchange (*padi organik*).

Figure 3. *Menajuk* practice

In Figure 3, community members in Sik, Kedah, practicing *menajuk* (sowing *padi huma* seeds) together. This collective activity, involving women, men, and children, embodies the spirit of *gotong-royong* and intergenerational knowledge transfer that sustains traditional upland rice cultivation and strengthens community cohesion.

The study adopted a reflexive and participatory approach, recognising farmers not as research subjects but as co-constructors of knowledge. Thematic coding was used to analyse transcripts and fieldnotes, structured around the three research objectives: (1) to understand how *padi huma* and *padi organik* contribute to food sovereignty; (2) to analyse the challenges of sustaining alternative farming systems; and (3) to assess the role of community and state actors in supporting bottom-up agricultural transformation. Through this process, three analytical dimensions emerged through autonomy, structural

barriers, and community-state collaboration which informed the cross-case synthesis and subsequent policy implications.

Together, these two case studies provide an empirically grounded understanding of how rural communities in Sik, Kedah, pursue alternative farming pathways that balance tradition, innovation, and institutional engagement. The methodological design thus serves not only to describe farming practices, but to illuminate how localised strategies of adaptation and cooperation can strengthen the broader agenda of food sovereignty as an extension of food security and human security in Malaysia.

FINDINGS: OPERATIONALISING FOOD SOVEREIGNTY IN SIK, KEDAH

The fieldwork conducted in Sik, Kedah, provides compelling empirical evidence that alternative rice production is not merely a niche practice but a viable attempt to preserve local knowledge and establish a resilient food system that counters the logic of conventional industrial agriculture. This section argues that food sovereignty models, specifically *padi huma* and *padi organik*, constitute a powerful grassroots assertion of autonomy, directly challenging entrenched structural dependencies.

Finding 1: From Dependency to Sovereignty—Transforming Agricultural Relations

The alternative farming models in Sik demonstrate that food sovereignty operates through three interconnected mechanisms: operational autonomy, ecological integrity, and moral authority that collectively transform farmers from dependent recipients to sovereign producers. Unlike conventional paddy cultivation that depends on government subsidies, certified seeds, and chemical inputs, practitioners of padi huma and organic paddy achieve a greater

degree of independence. Farmers exercise complete control over production decisions, as articulated by Yusof Ismail (2025:interview): "We can determine what seed variety to use, planting rotation, where to sell, at what price." The low price of conventional rice reflects market control. In contrast, this operational autonomy translates into economic sovereignty through premium pricing—*padi huma* sells for RM30–40 per kilogram compared to RM2.60 for conventional rice—showing clear market recognition of its ecological quality and cultural value.

Figure 4. Traditional rice seeds

In Figure 4, traditional rice seeds preserved for replanting, symbolising continuity, resilience, and the community's right to maintain local varieties as the foundation of food sovereignty in Sik, Kedah.

Ecological integrity emerges as both a practical method and a political statement, rejecting industrial agriculture's "dead soil" and chemical dependency through regenerative practices. The Islamic principle of *Rahmatan lil 'Alamin* guides the SRI Lovely project's systematic ecological design, where native fauna provide natural pest control and farmers produce their own bio-organic fertilisers. Zakaria Kamantasha explains: "We create an ecology system where everything works together, the birds control pests, the fish fertilise the fields, the trees provide habitat" (2025).

This ecological approach extends to seed sovereignty, with farmers maintaining eleven traditional varieties including Bario, *padi hitam*, and *pulut hitam*, preserved through customary methods of hanging seeds with stalks. Such practices constitute active resistance to what farmers term the "kartel" (corporate seed systems that monopolise the market, including critical agriculture inputs like seeds and fertilisers).

Figure 5. Ecological design at SRI Lovely, Kampung Belantik

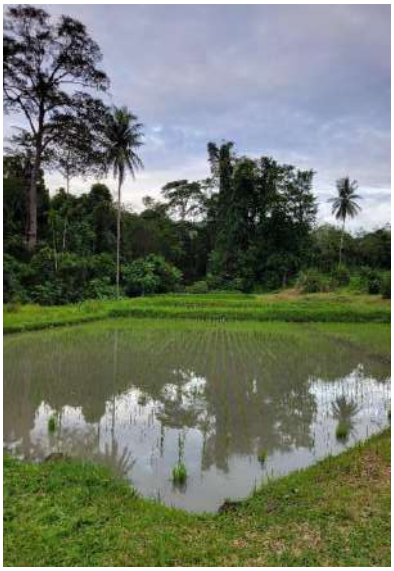


Figure 5 shows the ecological design at SRI Lovely, Kampung Belantik, where organic paddy cultivation follows the System of Rice Intensification (SRI). The integrated layout combines water management, biodiversity conservation, and faith-based ecological ethics to sustain

Social resilience through collective organisation challenges the individualistic logic of industrial agriculture while addressing practical labour constraints. The *gotong-royong* (or *berderau*) system ensures community-wide participation in labour-intensive activities like planting and harvesting. This reciprocal labour exchange where community members work each farmer's field in rotation, reduces costs while strengthening social bonds. Women's significant participation, exemplified by farmers like Kak Yah, demonstrates inclusive governance of local food systems.

The moral dimension underlies these practices, with farmers asserting ethical imperatives: "*Halal lagi toyyib*, (pure and clean), we know the source of our food from beginning to end" (Zakaria Kamantasha, 2025). This ethical stance elevates food sovereignty beyond economic calculation to encompass spiritual and cultural values.

Finding 2: Structural Barriers—The Political Economy of Agricultural Marginalisation

Despite achieving internal sovereignty, alternative farming confronts systematic structural barriers that reveal how policy frameworks actively maintain industrial agricultural hegemony. The productivity paradox exemplifies this challenge: while *padi huma* yields (1.5-2 tonnes per acre) fall below conventional rates (4-5 tonnes), its premium price compensates for volume. However, this model remains vulnerable to market fluctuations and limited consumer awareness. Climate vulnerability compounds these challenges, as

rainfall-dependent cultivation faces increasing unpredictability. Even state-provided sprinkler systems cannot fully mitigate drought risk, forcing farmers to navigate between traditional practices and modern adaptations. Another pressing challenge is the transmission of local agricultural knowledge across generations. In Sik, the declining participation of youth threatens the continuity of traditional farming skills, ecological wisdom, and communal stewardship embedded in *padi huma* practices.

The policy and subsidy paradox most starkly reveals institutional bias toward industrial agriculture, creating systematic disadvantage for ecological alternatives. Zakaria Kamantasha articulates this inequity: "If the government can subsidise chemicals, why not organic inputs?". This disparity forces ecological farmers to self-finance their transition while competing against subsidised conventional production. Current subsidies covering seeds, fertilisers, pesticides, and price support exclusively benefit chemical-intensive methods. The absence of equivalent support for organic inputs, traditional seeds, or agroecological knowledge constitutes active discrimination against sustainable practices.

Figure 6. Traditional seed-saving practice

Figure 6 shows the traditional seed-saving practice in Sik, Kedah, where harvested paddy bundles are hung and dried for future planting. This method preserves varietal purity, maintains seed viability, and reflects the community's commitment to local ecological knowledge.

Legal frameworks designed for industrial standardisation inadvertently criminalise traditional agricultural practices and indigenous innovation. Centralised seed registration requirements potentially illegalise cultivation of non-certified traditional varieties that communities have maintained for generations. Restrictions on inter-state seed movement, particularly between Peninsular Malaysia and Borneo, prevent farmers from legally accessing adapted varieties. DOA officials acknowledge these constraints but lack authority to modify regulations designed for industrial uniformity. This bureaucratic rigidity, described by farmers as "*karenah birokrasi*,"

reflects deeper contradictions between centralised control and local innovation.

Finding 3: Institutional Dynamics—Navigating State Support and Community Autonomy

The relationship between state institutions and food sovereignty initiatives reveals complex dynamics of convergence and contradiction, where strategic alignment enables resource access while maintaining operational autonomy. The LZNK's Smart SBBA programme exemplifies productive state-community collaboration, providing *asnaf* farmers with land access, microcredit, and infrastructure without imposing technological packages. This support model—offering resources while respecting farmer decision-making—contrasts sharply with conventional agricultural extension that prescribes specific methods. LZNK's objective of transforming aid recipients into *pembayar zakat* (zakat contributors) aligns with food sovereignty's emphasis on producer dignity and self-reliance, though motivations differ—economic for the state, philosophical for communities.

Community pioneers function as crucial intermediaries, translating between local knowledge systems and institutional requirements while maintaining cultural authenticity. Zainoodin Isa's role coordinating among *padi huma* cultivators, government agencies, and market actors demonstrates the importance of boundary-spanning leadership. These pioneers preserve traditional knowledge while adapting to contemporary contexts, teaching younger generations customary practices while engaging modern certification systems. Their legitimacy stems from demonstrated outcomes such as healthy crop yields, premium market prices, and ecological restoration, rather than formal institutional credentials. This form of grassroots authority

challenges technocratic paradigms that privilege certified expertise over experiential and community-based knowledge.

Strategic political recognition temporarily elevates alternative agriculture from marginal practice to state priority, though structural constraints persist. The symbolic planting of *padi huma* at the Menteri Besar's residence and visits by the Tengku Mahkota Kedah signal high-level validation of traditional farming. Such gestures generate publicity and bureaucratic attention, temporarily overcoming institutional inertia. However, this recognition remains largely ceremonial without corresponding policy reform. The gap between political acknowledgment and systematic support reveals the limits of working within existing frameworks, suggesting a need for fundamental restructuring of agricultural governance toward participatory, ecology-centered approaches.

DISCUSSION: TOWARD HUMAN-CENTRED FOOD SECURITY THROUGH SOVEREIGNTY

Reconceptualising Food Security Through Human Security Lens

The Sik findings demonstrate that food sovereignty operationalises human security by addressing multiple vulnerabilities simultaneously, providing a more comprehensive approach to food security than technical interventions alone. Conventional food security, measured through availability and access metrics, fails to capture the multidimensional nature of food insecurity as experienced by smallholder farmers. The human security framework reveals how food insecurity intersects with economic marginalisation (dependency on subsidies), environmental degradation (chemical pollution), social disruption (loss of *gotong-royong*), and cultural erosion (disappearance of traditional varieties). Food sovereignty practices in Sik address these interconnected vulnerabilities through integrated strategies that rebuild security from the ground up.

Economic security through food sovereignty manifests as freedom from dependency rather than mere income improvement, transforming the nature of rural livelihoods. Premium prices for *padi huma* provide immediate economic benefits, but more significantly, farmer control over pricing and marketing decisions ensures long-term stability. This contrasts with conventional farmers' vulnerability to price fluctuations, subsidy changes, and middleman exploitation. Input autonomy by producing own seeds and organic fertilisers may further reduce economic vulnerability while retaining capital within communities. The transformation of *asnaf* recipients into *zakat* contributors exemplifies how food sovereignty converts aid dependence into economic dignity.

Environmental security emerges through ecological practices that restore rather than deplete natural capital, ensuring long-term agricultural viability. The rejection of chemical inputs addresses immediate health threats while rebuilding soil fertility for future generations. Traditional varieties' adaptation to local conditions provides climate resilience unavailable through uniform high-yielding varieties.

Biodiversity conservation—maintaining eleven rice varieties—creates genetic insurance against pests, diseases, and climate change. These practices demonstrate that environmental security requires not just sustainable resource use but active ecological restoration, reversing decades of industrial degradation.

Policy Implications for Food System Transformation

The success of food sovereignty initiatives despite systematic disadvantages reveals both the limitations of current policy frameworks and possibilities for transformation through strategic

reform. Three critical policy shifts could amplify bottom-up innovations while addressing structural barriers.

First, subsidy rebalancing from chemical inputs toward agroecological practices would level the playing field while incentivising sustainable transition. Rather than eliminating existing subsidies, which would disadvantage all farmers, policy should create parallel support for organic inputs, traditional seeds, and ecological knowledge. This could include: subsidised bio-organic fertiliser production facilities at village level; payment for ecosystem services recognising biodiversity conservation; and premium price guarantees for certified ecological produce. Such measures would make sustainable farming economically competitive while maintaining farmer choice.

Second, regulatory reform should recognise and protect agricultural biodiversity as national heritage rather than impediment to modernisation. Creating a separate registration pathway for traditional varieties—similar to geographical indications—would legalise their cultivation while preventing biopiracy. Allowing inter-state seed exchange for registered traditional varieties would enable adaptation to climate change. Recognising community seed banks as legitimate conservation institutions would formalise farmers' role as biodiversity custodians. These reforms acknowledge that agricultural resilience requires genetic diversity, not uniformity.

Third, institutional restructuring towards participatory governance would align agricultural administration with food sovereignty principles. Establishing farmer councils with decision-making authority over local agricultural programmes would ensure relevance to community needs. Creating positions for “community agricultural officers" selected by farmers would bridge institutional-community divides. Mandating participatory evaluation of agricultural

programmes would privilege farmer-defined success over abstract metrics. These changes would democratise agricultural governance while maintaining institutional support.

Theoretical Contributions: Food Sovereignty as Human Security Practice

The Sik cases provide empirical evidence that food sovereignty constitutes practical implementation of human security, not abstract ideal or romantic return to subsistence. By demonstrating viable alternatives that enhance multiple securities simultaneously, these communities prove that human-centred development is achievable through bottom-up organisation. The integration of traditional knowledge with modern ecological science shows that progress need not require abandoning cultural foundations. The achievement of premium markets while maintaining ecological integrity challenges assumed trade-offs between sustainability and profitability.

This study's findings extend food sovereignty theory by revealing how principles translate into practice through contextual adaptation rather than uniform application. While sharing commitment to autonomy, ecology, and solidarity, *padi huma* and *padi organik* represent different organisational models—communal-traditional versus coordinated-systematic. This diversity suggests food sovereignty's strength lies not in prescribed methods but in principles that enable local innovation. The role of state institutions as conditional enablers rather than directors points toward new governance models that support without controlling community initiatives.

Alignment and Friction with the SDGs: Focusing on SDG 2 and 12

The experiences of *padi huma* and *padi organik* (SRI method) farmers in Sik, Kedah, illustrate how grassroots food sovereignty practices directly advance key global development goals, particularly SDG 2

(Zero Hunger) and SDG 12 (Responsible Consumption and Production). These two goals encapsulate the dual ambitions of ensuring equitable access to food while transforming the means of its production toward ecological sustainability.

In relation to SDG 2 (Zero Hunger), the practices of seed sovereignty and the preservation of diverse local rice varieties such as *padi huma* contribute significantly to food self-reliance and the conservation of genetic resources. These traditional varieties, adapted to the local ecosystem, embody resilience in the face of market and climatic uncertainties. Community-driven initiatives such as collective seed saving and *gotong-royong* labour ensure that food production remains under the control of farmers themselves, fulfilling the right to food that is not only available but also culturally appropriate and ecologically grounded. However, this alignment is constrained by structural frictions: the persistence of low yields (1.5–2 tons per acre), inadequate market access, and policy frameworks that privilege industrial-scale production limit the scalability of these smallholder systems. Despite their ecological soundness, such practices often remain peripheral to national food policy, which continues to measure success in terms of volume rather than sustainability or nutritional value.

Figure 7. A communal meal in Sik, Kedah

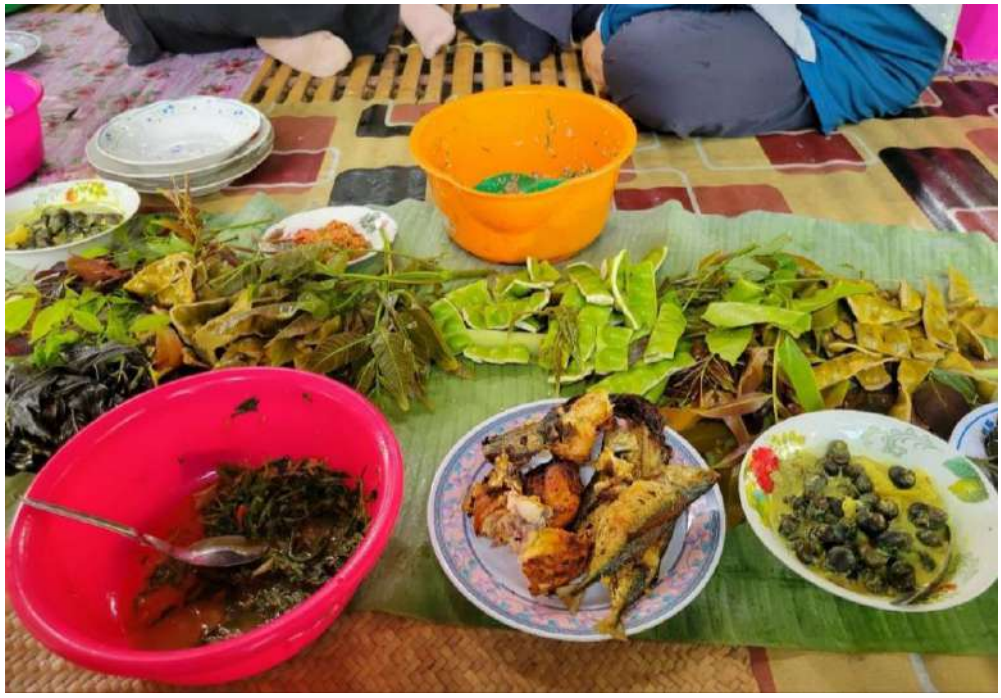


Figure 7 shows a communal meal in Sik, Kedah, featuring a variety of traditional ulam-ulaman gathered through foraging. This food culture reflects the community's deep ecological knowledge, self-sufficiency, and enduring connection to the local landscape and food heritage.

Equally, SDG 12 (Responsible Consumption and Production) is deeply embodied in the ecological ethics of both *padi huma* and organic SRI farming. The guiding principle of *rahmatan lil alamin*, cultivating in harmony with nature, rejects chemical fertilisers and pesticides, relying instead on bio-organic composting and natural pest control. These practices protect soil fertility, maintain water quality, and safeguard biodiversity, demonstrating how responsible production can coexist with viable livelihoods. Yet, institutional friction persists in the form of regulatory and policy barriers: centralized seed registration systems and the lack of organic input subsidies reinforce

dependence on external, industrial supply chains. Farmers seeking to innovate with local varieties must often navigate restrictive approval processes, such as the need for Malaysian Agricultural Research and Development Institute (MARDI) certification, which delays or discourages the expansion of sustainable methods.

Taken together, the Sik experience shows that while local food sovereignty initiatives strongly align with the intentions of SDG 2 and SDG 12, realising their full potential requires policy realignment. National agricultural strategies must evolve from emphasising productivity alone to supporting ecological balance, farmer autonomy, and cultural continuity. Only by bridging this gap between grassroots innovation and institutional recognition can Malaysia advance a food system that is not just secure, but sovereign and sustainable.

POLICY RECOMMENDATIONS: AN INTEGRATED FRAMEWORK FOR FOOD SOVEREIGNTY

Immediate Actions: Removing Barriers and Creating Opportunities

Policy reform must begin by eliminating active discrimination against ecological farming while creating positive incentives for sustainable transition. The following measures require minimal structural change but would significantly improve conditions for alternative agriculture:

1. Establish Organic Input Subsidy Programme: Match existing chemical fertiliser subsidies with equivalent support for certified organic inputs, bio-pesticides, and composting infrastructure.
2. Create Traditional Variety Registration Fast-Track: Implement expedited registration for documented traditional varieties, waiving standard uniformity requirements while maintaining quality standards.

3. Launch Premium Market Development Initiative: Establish dedicated retail spaces in government facilities for ecological produce, guaranteed procurement for school feeding programmes, and promotional campaigns highlighting nutritional and cultural value.
4. Provide Transition Support Grants: Offer three-year financial support for farmers converting from conventional to ecological methods, covering income shortfalls during adjustment period.

Medium-Term Reforms: Restructuring Agricultural Governance

Systemic transformation requires fundamental changes in how agricultural policy is formulated, implemented, and evaluated. These reforms would shift from top-down prescription toward participatory governance:

1. Establish National Food Sovereignty Council: Create a multi-stakeholder body including farmer organisations, NGOs, research institutions, and government agencies to oversee policy integration.
2. Implement Participatory Technology Development: Redirect research funding toward farmer-led innovation, supporting community experimentation with ecological methods.
3. Develop Agroecological Extension Service: Train new cadre of extension officers in ecological principles, traditional knowledge, and participatory methods.
4. Create Community Seed Banking System: Establish a network of legally recognised community seed banks with technical support for conservation and exchange.

Long-Term Vision: Food Sovereignty as National Strategy

Malaysia should develop a comprehensive Food Sovereignty Act establishing a legal framework for democratic, ecological, and equitable food systems. This legislation would:

1. Recognise Food as Human Right: Establish state obligation to ensure not just food access but community control over food systems.
2. Protect Agricultural Biodiversity: Declare traditional varieties and associated knowledge as national heritage requiring active conservation.
3. Ensure Farmer Representation: Mandate farmer participation in all agricultural policy bodies with voting authority.
4. Prioritise Local Food Systems: Require public procurement to source from local ecological producers where available.

CONCLUSION

This study of alternative paddy farming in Sik, Kedah, shows that food sovereignty represents a necessary evolution of Malaysia's food security policy, one that integrates human security beyond production metrics. Through *padi huma* and organic SRI models, farmers demonstrate how sovereignty principles translate into practice by enhancing autonomy, ecological integrity, and community resilience. These bottom-up innovations achieve what decades of top-down modernisation have failed to deliver: viable, sustainable, and just food systems that restore dignity to rural producers.

The transformation from dependency to sovereignty occurs through three mechanisms: operational autonomy that empowers farmers to control production and earn premium prices; ecological practices that restore biodiversity and soil health; and collective organisation through *gotong-royong* that rebuilds social capital. These findings

affirm that food sovereignty is not a nostalgic return to subsistence but a pragmatic strategy for resilience and self-determination.

Persistent structural barriers, however, reveal how current policies reinforce industrial agricultural dominance. The subsidy bias toward chemical inputs, restrictive seed laws, and bureaucratic rigidity constrain ecological innovation. These are political choices, not technical flaws, reflecting entrenched power relations in Malaysia's food system. Overcoming them requires participatory, ecology-centred governance that redistributes authority and supports farmer-led initiatives.

The collaboration between LZNK and *padi huma* communities illustrates the potential of hybrid governance by providing resources without imposing control. Yet, symbolic gestures must evolve into systemic reform that institutionalises equity and autonomy within agricultural policy.

This research contributes three key insights: first, it documents food sovereignty as lived practice, proving the viability of community-based alternatives; second, it reveals how state–community partnerships can align resources with autonomy; and third, it bridges food security and human security, showing how sovereignty addresses economic, ecological, and social vulnerabilities simultaneously.

The implications extend beyond agriculture to broader questions of development and dignity. As Malaysia faces climate stress and rural inequality, the Sik experience offers a model for sustainable and inclusive transformation. Food sovereignty emerges as an alternative modernisation—grounded in ecology, solidarity, and cultural continuity. The path forward is clear: Malaysia can either persist with industrial intensification and its social costs or embrace food

sovereignty as the foundation for democratic, resilient, and human-centred food systems. The farmers of Sik have shown what is possible; the next step is institutional commitment to scale these practices into national policy.

STATEMENTS AND DECLARATIONS

Funding Statement

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Malaysia's rice sector faces a structural tension between yield-centered national policies and rural realities of economic precarity and ecological decline. This study argues that food sovereignty, practiced through padi huma (traditional upland rice) and organic System of Rice Intensification (SRI) in Sik, Kedah, extends food security by integrating human security dimensions. Using qualitative fieldwork in August 2025 and the UNDP human security framework, the research examines how smallholders operationalise sovereignty. Findings identify three core mechanisms: operational autonomy, ecological integrity, and social resilience through gotong-royong (collective labour). These practices enable premium pricing and soil regeneration while rebuilding social dignity. Despite successes, systemic barriers (including chemical-centric policy bias and restrictive seed regulations) hinder progress. However, partnerships like the Lembaga Zakat Negeri Kedah's Smart SBBA programme illustrate the potential for hybrid models that combine state resources with grassroots autonomy. The study concludes that food sovereignty is a governance strategy that bridges technical production metrics with human security. Policy reform must redirect subsidies towards organic systems and institutionalise participatory governance. Aligning these shifts with SDGs 2 and 12 will embed autonomy and sustainability into Malaysia's agricultural future.

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