

Unveiling Malaysia's Food Security Preparedness: A Content Analysis Perspective

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ABSTRACT

Food security is always a global concern and raises various issues. The absence of food security may result in conflict, civil strife, poverty, starvation, malnutrition, undernourishment, and increased susceptibility to disease. Many countries have formulated specific policies to address the issue of food supply, sustainability, and preparedness in food security. Malaysia is no exception. Several government policy documents have mentioned food security as one of the highlights of the government agenda. However, food security preparedness issues in these documents were minimally evaluated. This study aims to evaluate the emphasis of Malaysian policy documents on food security preparedness and supply. The National Food Security Policy Action Plan 2021-2025, National Agri-Food Policy 2.0 2021-2030, and Budget 2023 Malaysia Madani reports have been selected and analysed using content analysis, looking for similarities through the set keywords. As a result, the National Food Security Policy Action Plan 2021-2025 focuses more on food security preparedness than other policies. It addresses issues like availability, access, consumption, stability, and sustainability. Four themes have emerged in content analysis: crisis management, preparedness, collaboration and agriculture. These variables indicate the need for better preparedness for food security. Furthermore, recommendations deemed appropriate for enhancing food security and proactive preparedness efforts are also outlined.

Keywords: Food security, Preparedness, Policy, Malaysia, Food Supply, SDG

INTRODUCTION

Countries worldwide emphasise food security through strategies such as self-reliance, self-sufficiency, and sovereignty [9]. These strategies aim to ensure access to sufficient, safe, and nutritious food for their populations. Food security is approached at different levels, such as farming, national, and international and is interconnected with factors like education, healthcare, and agricultural policies [6]. The concept of food security has evolved to include not just availability but also access, utilisation, and stability of food. Efforts to address food security globally involve financial commitments to establish safety nets, especially in lower-income countries, to combat issues like food insecurity, malnutrition, and poverty. The goal is to provide reliable access to food for all individuals, promoting health, well-being, and sustainable development.

Recently, many food security issues have arisen due to the lack of food supply and the instability of food supplies and stocks in the country [16]. It is a consequence of the often unstable supply and low food production levels today.

The Malaysian food market is not resilient enough to face market and climate changes. The Malaysian food supply chain has faced various challenges in recent years, including the COVID-19 pandemic, climate change, and geopolitical issues, which have affected the availability, accessibility, and affordability of food. Research and analysis indicate that addressing food insecurity and climate change in Malaysia is crucial due to potential adverse impacts such as a decline in productivity, demographic changes, economic growth slowdown, and challenges in food security [27].

Malaysia faces vulnerabilities and threats to food security, including high dependence on food imports, limited agricultural productivity, and challenges related to climate change. The country's heavy reliance on imports for essential food products, low agricultural productivity compared to high-income countries, and growing dependence on food imports pose significant challenges to achieving food security. Additionally, the impact of climate change on agricultural production exacerbates vulnerabilities in Malaysia's food security landscape. Despite Malaysian efforts to address this issue by focusing on policy implementation, strengthening local and national food systems, addressing all pillars of food and nutrition security, and improving coordination with new technologies and multilateral platforms, the problems remained unsolved.

According to the Malaysian Ministry of Health, food can also pose a risk to the general public's health in addition to being an agricultural and commercial product [30] [34]. Thus, the success of food security programs that protect consumers from health risks and fraud while promoting food trade is necessary to preserve development in the food industry. The importance of food security or risk management cannot be understated, especially during a food security crisis, given the potential impact on the economy and public health.

The objective of this article is to study the emphasis of food security preparedness in government policy that is relevant and important for the present time. The selected documents can evaluate the policy in Malaysia that focuses on the topic of preparedness in food security and how aspects of readiness have been elaborated and discussed. However, the highlighting of food security issues, especially preparedness issues, in the form of this document has been minimally evaluated. There is a lack of research on food security preparedness in Malaysian policy documents.

LITERATURE REVIEW

Food insecurity has been a major worldwide problem due to global pandemics, conflict, economic disparity, and climate change [33]. Over the past few decades, significant progress has been made in reducing hunger and malnutrition; nevertheless, recent challenges threaten this success [42]. Extreme weather events brought on by climate change impair agricultural productivity, resulting in crop failures and food shortages in susceptible areas. Furthermore, the pandemic has exacerbated economic instability, leading to the impoverishment of millions of individuals, so limiting their ability to obtain nourishing sustenance. There are ongoing disparities in the allocation and accessibility of food, which disproportionately affect underprivileged groups. To tackle these problems, it is crucial to adopt a comprehensive approach that encompasses equitable economic policies, robust social safety nets, and sustainable agricultural practices [35].

Investing in climate-resilient agriculture, including drought-tolerant crops and enhanced irrigation techniques, is imperative to guarantee a consistent food supply amidst shifting environmental circumstances. Furthermore, programs to empower small-scale farmers, especially those in developing nations, can improve local resilience and food sovereignty. To address the systemic problems that underlie food poverty, promoting Collaborative international initiatives is crucial to inclusive economic growth and ensuring that everyone has equitable access to wholesome food.

This emphasis on food security is also manifested in the Sustainable Development Goals (SDGs). Several goals related to food security are part of the SDGs set by the United Nations. To meet dietary demands and food preferences for an active and healthy life, one must have access to sufficiently safe, nutritious, and sufficient food. By 2030, the SDGs want to end hunger, ensure food security, improve nutrition, and support sustainable agriculture [41]. SDG 2 that Zero Hunger aims to "end hunger, achieve improved food security and nutrition, and promote sustainable agriculture" by 2030 [41].

According to the Food and Agriculture Organization of the United Nations [3], this SDG is specific to eradicating hunger and malnutrition, creating food security, improving nutrition, and advancing sustainable agriculture, which are the objectives of this target. It guarantees everyone access to safe, nutritious, and sufficient food year-round. Promoting sustainable agricultural practices, doubling farm production and income of small-scale food producers, improving food systems and agricultural value chains, and reducing food waste are some of the goals that promote this goal.

SDG 12, Responsible Consumption and Production, aims to "ensure sustainable consumption and production patterns" by 2030 [41]. The objectives in SDG 12, according to the Food and Agriculture Organization of the United Nations [3], aim to promote sustainable consumption and production patterns, including minimising food loss and waste. These goals aim to promote sustainable practices from food production to food consumption. It clearly states a unique goal that focuses solely on food security. This specific goal requires quality planning, not just promising that the supply is available and sufficient. It is a big step in ensuring that everyone in this country, regardless of age and race, has adequate, nutritious, and safe food supplies.

Despite all efforts taken by the Malaysian government, Malaysia is still highly dependent on food imports, with a food import bill of RM64 billion in 2022. This heavy reliance on imports poses a significant financial burden to the country and makes it vulnerable to global supply chain disruptions. Additionally, there is a need to minimise high dependency on imported food to improve food security and stabilise food prices [13].

If the government fails to address the issue of food security in Malaysia, there will be several consequences for the nation. Firstly, Malaysia's dependence on food imports will continue to increase, leading to a growing trade deficit of food products and a decrease in global bargaining power. It made the country increasingly dependent on other countries for its food supply, which could be disrupted by geopolitical tensions or other factors beyond Malaysia's control. Secondly, food insecurity is correlated with poverty and health issues, which could exacerbate existing social and economic inequalities in Malaysia [24]. The COVID-19 pandemic has already brought the food and nutrition security challenge to the fore, and failure to address this issue could lead to pervasive poverty, hunger, inequality, and social instability. Thirdly, Malaysia's agricultural productivity is currently only 45% of the average among high-income countries, and the agriculture sector faces structural issues related to uncertainty over farm ownership and leasing, labour shortages, low productivity and quality of agricultural produce, low level of automation and technology adoption, and high dependence on foreign labour. Failure to address these issues could hinder Malaysia's economic growth and development. Malaysia's food security is closely linked to climate change, as unexpected rainfall and floods have destroyed farms and crops across the country, causing damages exceeding RM68mil in the agriculture industry [27]. Failure to address climate change and adapt to its impacts could further undermine Malaysia's food security.

Simultaneously, food insecurity is also a result of insufficient food supply. The country's heavy reliance on food imports will significantly impact its food reserves. Rice (30%), beef (78%), mutton (90%), and round cabbage vegetables (60%) are among the essential foods that Malaysia invests RM 50 billion in imports every year [20]. Malaysia also depends on imported goods such as mutton, mangoes, coconuts, and beef for local purposes. Malaysia experienced a trade deficit of RM 25 billion in agro-food in 2021 due to imports of RM 64 billion compared to exports of RM 39 billion [20]. This shows that importing essential goods, especially food products, increased by over 80%. Finally, the country's dependence on imported food supplies means that any change in the cost of imports will affect the country's food cost [20]. As a result, the cost of food will increase, which will affect the purchasing power of consumers. These multiple effects have undermined the level of preparedness in food security.

The concept of preparedness encompasses various measures and policies adopted before an event to mitigate damage and minimise dysfunction. It includes planning, resources, and capacities to combat potential deleterious effects of hazards, ultimately reducing community vulnerability [39]. In the context of food security, the term "preparedness" refers to the state of being ready to address potential food security risks and ensure a sustainable food supply [10] [17] [43]. Preparedness in food security involves being equipped to manage potential food security risk factors and enhance food security management in the food industry [43]. It ensures access to sufficient, safe, and nutritious food to maintain a healthy life, a fundamental aspect of food security [10]. The concept of preparedness also involves addressing issues such as outdated processing techniques, imperfect national standards, and safety risks in the food industry to promote healthy and sustainable development [43].

Previous research has emphasised the significance of readiness for ASEAN food security. These studies

underscore the importance of tackling food production, supply chains, affordability, and nutrition issues to guarantee food security and economic stability. Agriculture has historically been essential to the socioeconomic growth of ASEAN nations, with a shift towards contemporary technologies and private sector involvement following the "Green Revolution" era. Southeast Asia's changing socioeconomic and agri-food landscape highlights the numerous difficulties affecting food and economic security, where countries are classified into distinct income categories [40].

Additionally, these studies' recommendations include raising rice reserves at the national and regional levels, improving community-based food security programs, encouraging consumer education to wean themselves from rice, and bolstering coordination among ASEAN's food and agriculture-related mechanisms. The market's stability depends on efforts to increase rice inventories through programs such as the ASEAN Plus Three Emergency Rice Reserve (APTERR). Promoting cassava as an alternative to rice because of its nutritional qualities and resistance to drought is also recommended to improve food security in the area [26]. Previous studies have highlighted the necessity of taking proactive steps and being prepared to solve ASEAN's food security issues, stressing the significance of collaboration, resilience, and innovation in guaranteeing the region's sustainable food systems. Past studies regarding food security preparedness in Malaysia have highlighted significant challenges and the need for comprehensive strategies to address food insecurity, especially in the face of climate change and natural disasters. Research indicates that Malaysia has a history of policies related to agriculture and food, but these policies have often fallen short in ensuring food security due to inconsistencies in self-sufficiency targets and heavy reliance on imports [18]. The National Agrofood Policy 2011-2020 aimed to address food security, competitiveness, sustainability of the agro-food industry, and income levels of agropreneurs, but it faced challenges in implementation [18].

Furthermore, Malaysia's food security situation has been concerning despite policy initiatives. Over the past ten years, the nation's scores on several food security criteria have decreased, notably in availability and natural resource resilience [18]. Floods, a frequent natural calamity in Malaysia that is made worse by climate change hurt trade networks, disrupt food production, and cause short- and long-term food insecurity [19]. These disruptions have decreased access to sufficient and suitable food [19]. In conclusion, previous research highlights the significance of improving disaster risk reduction measures to ensure food security in Malaysia. Although the nation has put policies and plans in place to deal with these issues and reduce the effects of disasters on food security, there is a need for ongoing development and the integration of disaster risk reduction measures into national initiatives [19].

Table 1 below presents Malaysia's performance in the Global Food Security Index (GFSI) for 2020 through 2022.

Table 1: The performance of malaysia in GFSI 2020 – 2022

Year	Ranking in GFSI (/113 Countries)	Overall Score in GFSI (/100)	Performance	Affordability Position (/100)	Availability Position (/100)	Quality and Safety Position (/100)	Sustainability and Adaptation Position (/100)
2020	43	67.9	Good	25	56	50	52
2021	39	70.1	Good	28	36	46	66
2022	41	69.9	Moderate	30	56	38	57

Sources: Ministry of Agricultural and Food Security

In 2020, Malaysia's food security performance was measured through the Global Food Security Index (GFSI) and was ranked 43 out of 113 countries. In 2021, Malaysia's position increased and was ranked 39.

This shows that food security in Malaysia is not at a worrying level because it is increasingly getting better. However, in 2022, Malaysia's performance declined slightly and was ranked 41st. This shows that Malaysia is in a threatened somewhat state and needs to take initial steps and efforts to ensure Malaysia's performance improves by ensuring Malaysia is prepared for food security.

Realising that food security has become increasingly important recently, the Malaysian government has implemented various concerted efforts to ensure that food security is always regulated and guaranteed. This can be seen in the country's policies, which have constantly improved over the last decade.

Based on the evaluation, Figure 1 below illustrates the progression of policies in Malaysia's Ministry of Agriculture and Food Security.

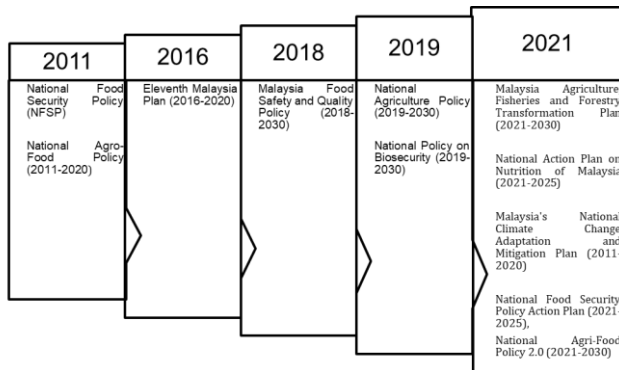


Figure 1: The policy evolution related to Malaysia's Ministry of Agriculture and Food Security.

The evolution of policies related to the Ministry of Agriculture and Food Security in Malaysia showcases strategic progress that addresses various aspects of agricultural development, food security, nutrition, biosecurity, and climate change adaptation. Overall, these policies demonstrate Malaysia's dedication to guaranteeing food security, advancing sustainable agriculture, enhancing food security and quality, tackling issues related to nutrition, and adjusting to the consequences of climate change on the agricultural industry. Every strategy or plan builds upon the framework established by its predecessor, bringing new strategic approaches, possibilities, and problems to accomplish the intended result. However, in Malaysia, no policy only focuses on food security preparedness.

METHODOLOGY

This study uses a qualitative approach to answering research questions using content analysis. It includes analysing textual data inductively, developing typologies from the data, organising the data into categories, and counting the occurrences of themes by thematic analysis [11]. This paper replicates the method used in Samad [44] by analysing the policy documents and developing significant themes in addressing issues of food security in Malaysia. Three national documents have been referred to as data sources in analysing the emphasis on food security preparedness in government policies that are relevant and important today, namely the National Food Security Policy Action Plan 2021-2025 published by the Secretariat of the Cabinet Committee on National Food Security Policy under the Ministry of Agriculture and Food Industry, National Agrofood Policy 2.0 2021-2030 published by the Policy and Strategic Planning Division under the Ministry of Agriculture and Food Industry and Budget 2023 Malaysia Madani published by the Ministry of Finance Malaysia. The table below provides details of the source of the document.

Table 2: selected document on preparedness of food security

No	Title of Document	Publisher	Year
1	National Food Security Policy Action Plan 2021-2025	Secretariat of the Cabinet Committee on National Food Security Policy, Ministry of Agriculture and Food Industry	2021

2	National Agrofood Policy 2.0 2021-2030	Policy and Strategic Planning Division, Ministry of Agriculture and Food Industry	2021
3	Budget 2023 Malaysia Madani	Ministry of Finance Malaysia	2023

There is no specific document that focuses on food security preparedness in Malaysia. Thus, the selection of this document is based on the focus of relevant documents in dealing with the issue of food security preparedness in Malaysia. It is also a reliable source because it is published by an organisation responsible for food security. The Ministry of Agriculture and Food Industry, now known as the Ministry of Agriculture and Food Security, is responsible for planning the direction of food security and food security in Malaysia. At the same time, the Ministry of Finance Malaysia allocates funds for activities and all planning to be done by the Ministry of Agriculture and Food Security for the future of this country's food security.

The National Food Security Policy Action Plan 2021-2025 is a strategic plan to ensure food security in Malaysia. This plan outlines actions and policies to safeguard the nation's food supply and address related challenges. It focuses on enhancing food production, distribution, and accessibility while considering sustainability and resilience in the face of various factors impacting food security. The plan is designed to be comprehensive, addressing critical issues in the food sector to meet the population's nutritional needs and mitigate risks to food availability and affordability.

The National Agrofood Policy 2.0 for 2021-2030 in Malaysia is a strategic framework aimed at comprehensively transforming the country's agro-food sector. Building upon the foundation of the previous National Agrofood Policy (NAP) from 2011 to 2020, NAP 2.0 focuses on ensuring food security while addressing sustainability, technology integration, and socioeconomic development challenges. This policy is aligned with Malaysia's national development agenda, including the Shared Prosperity Vision 2030, Malaysia Five-Year Development Plan, National Fourth Industrial Revolution Policy, and Malaysia Digital Economy Blueprint.

The Budget 2023 in Malaysia, known as Malaysia Madani, focuses on enhancing food security through various initiatives. The budget aims to address challenges such as rising commodity prices and disruptions in the food supply. The Malaysia Madani framework prioritises food security by modernising the agro-food industry, promoting technological advancements, and encouraging investments to ensure a sustainable and competitive food supply for the nation.

Information and quotes about food security preparedness are filtered using three main keywords, preparedness, food security, and food supply, using key keyword techniques in Portable Document Format (PDF). After the citations have been found, the citations are analysed. Data was analysed using thematic analysis by identifying several themes through grouping and categorising statements and quotes written in documents that explain food security preparedness in Malaysia. This analysis uses ATLAS.ti software version 23. The diagram below illustrates the methodological process for this study.

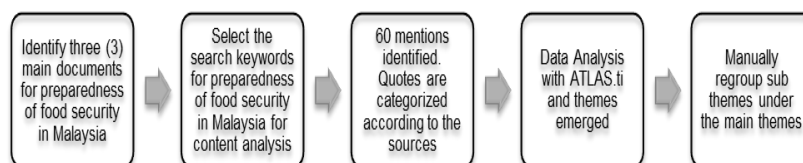


Figure 2: The Flow Process for Methodology.

This article examines Malaysian policy documents related to food security in general and further investigates specific documents on preparedness aspects in ensuring the food supply in the country is secured. The selection of three policy documents related to food supply security in Malaysia has been identified. As for

the three specific ones, the selected ones were 1) National Food Security Policy Action Plan 2021-2025, 2) National Agri-Food Policy 2.0 2021-2030 and 3) Budget 2023 Malaysia Madani.

The data were analysed qualitatively by using content analysis. Content analysis is a research technique for making replicable and valid inferences from texts (or other meaningful materials) to the context of their use [7]. It is a method used to describe written, verbal or graphic communications, and later, a quantitative description is developed from a qualitative one. Specifically, this paper employed a summative content analysis method, whereby the main goal was to discover the underlying meaning of data by quantifying words.

ANALYSIS AND FINDING

Based on the analysis of the three (3) national documents selected, Table 3 below extracts the quotes related to preparedness for food security.

Table 3: Quotes on preparedness for food security from various national documents.

No	Page	Quotes
National Food Security Policy Action Plan 2021-2025		
1	15	Empowerment Strategy: Preparedness during crises, disasters, emergencies, and post-crisis.
2	50	Strengthening inter-agency collaboration at all levels of the food supply chain according to respective areas of authority.
3	68	Enhancing acts and regulations to ensure the security of food sources and supplies.
4	69	Management of food supply-related crises more efficiently, orderly, and systematically.
5	96	Improving the food supply distribution system according to standard operating procedures (SOPs).
6	108	Supporting the assurance of national food supply (food security).
7	39	The prevalence of moderate or severe food insecurity among the population is assessed based on the Food Insecurity Experience Scale (FIES).
8	48	Introducing incentives for food producers who implement food security assurance programs and other equivalent measures.
9	48	The incapability of SMEs to implement food security assurance programs
10	61	Enhancing micro and small and medium enterprises (MSMEs) to obtain certification related to food security assurance programs and equivalent standards.
11	61	The inability of food producers to implement food security assurance programs.
12	79	Enhancing the resilience of the industry in maintaining certification related to food security assurance programs and equivalent standards.
13	18	The challenge of enhancing the adoption of technology in the food system: Preparedness of the public/consumers to use applications/systems developed by the ministry.
14	38	A proposed solution is to conduct studies and surveys based on food security:

		Availability of agencies to provide monthly data at the state and district levels.
15	40	Establishing a Nutrition Enhancing Agriculture-Food Supply Calculator as a minimum reference for availability (food production and import planning) based on the recommendations of the Malaysian Dietary Guidelines (MDG) 2020.
16	40	Making the Malaysian Dietary Guidelines (MDG) 2020 as the minimum reference to ensure food availability within the country.
17	42	Establishing Malaysia's reporting for Food Balance Sheet (FBS) indicators with technical support from FAO: FBS will become the primary source of information and trends on food availability within the country. It can provide the status of the population's food security and information on levels of inadequacy and food waste within the country.
18	48	Identifying and introducing incentives and assistance to encourage the availability and access of safe and healthy food in the market.
19	112	Ensuring the availability of vegetables and fruits to subsequently increase the intake of vegetables and fruits.
20	112	Establishing more spaces/areas for farming (residential/building areas and public facility sites) to increase the availability of fruits and vegetables.
National Agrofood Policy 2.0 2021- 2030		
21	254	The agri-food sector from 2021-2030 needs to be developed to achieve a high level of readiness to address various challenges facing the country, while also increasing the welfare level of food producers throughout the value chain, including achieving environmental sustainability.
22	78	DAN 2.0 emphasises the importance of the public sector's role in driving the modernisation of the agri-food sector through initiatives aimed at improving service delivery and enhancing the digital platforms of the public sector, as well as human capital development in the public service to enhance readiness for digital technology adoption.
23	94	Although the adoption of technology can help improve productivity and contribute to higher income, the level of readiness in terms of knowledge, expertise, and capital to implement this transformation among food producers, especially small-scale food producers, remains low.
24	105	Enhancing the readiness level of food producers to adopt technology (especially biotechnology) through structured and effective promotion, training, technical assistance, and financial support.
25	254	The resilience and readiness of the country have been tested by various shocks to food security levels due to the impact of the COVID-19 pandemic. This situation, combined with the agri-food sector's increasing interest in adopting 4IR technologies to enhance sector competitiveness, has led to the need to formulate a strategic direction and action plan for the next phase of development.
26	57	Natural disasters, especially floods and landslides, can devastate farmland, damage irrigation facilities, and disrupt drainage systems, consequently disrupting the food supply chain. Floods often occur in Malaysia during the monsoon season.

27	64	Food supply disruptions caused by various movement restrictions have exposed weaknesses in the supply chain and the need for mitigation measures to address disaster uncertainties.
28	88	DAN 2.0 focuses on various dimensions of food security to ensure sufficient food supply, including a focus on food security and nutrition, resilience of the value chain, and socioeconomic status of food producers. Additionally, emphasis will be given to effective policy implementation by strengthening collaboration with state authorities and industry stakeholders.
29	99	The United Nations has emphasised that the global agricultural system needs to be more productive, capable of reducing waste, and implemented in a holistic and integrated manner. This means that the country's food supply needs to be produced, processed, distributed, and utilised efficiently based on recommended dietary intakes with minimal waste. Quality and efficiency in handling and processing food products/outputs also need to be implemented throughout the value chain.
30	5	To continue development in the agri-food sector, DAN 2.0 has been formulated as a government effort to ensure food security through the transformation of the national food system.
31	12	With the global economy shifting to a constantly dynamic and competitive landscape, experiencing the pressures of a global pandemic that has and will continue to disrupt economic activities and individuals' livelihoods, food security has now become one of the primary focuses that will significantly impact the long-term development of the country. Therefore, the Malaysian government has decided to enhance the level of food security by further developing the agri-food sector, from various perspectives including economic, social, and environmental aspects.
32	31	The level of self-sufficiency is a key component of food security and serves as an indicator to measure a country's ability to meet its food needs from domestic production. The Malaysian government has set self-sufficiency level (SSL) targets for key food commodities to be achieved by 2030. SSL targets are dynamic goals that need to be actively monitored and managed.
33	31	SSL acts as a shield in times of hardship. If a global crisis strikes or global food shortages occur due to drought or climate change-induced disruptions in the supply chain, the focus usually shifts to SSL because the higher the SSL for specific food commodities, the less reliant a country is on international imports, thereby reducing the impact of adverse events as mentioned. SSL targets can be reassessed as circumstances evolve so that resources can be diversified or redirected accordingly to achieve national food security.
34	50	14% of the world's food experiences loss at the production stage before reaching the retail level. In certain situations, this food loss is unavoidable as most countries prioritise food security issues and maintain food as buffer stocks at the handling and storage stages.
35	76	Various dimensions of food security and food security in DAN 2.0 are addressed, and specific strategies are proposed to examine key food commodities with high local demand and trade.
36	95	Sustainable agricultural practices - including better plant and animal stocks, as well as efficient land and water management practices - can be key drivers in improving

		productivity and enhancing food security in Malaysia. This can also help maintain a balance between conservation and the use of resources for planting and farming activities.
37	118	Increased direct investment from both foreign and domestic investors in the agri-food sector can enhance production and productivity, thereby contributing to strengthening food security.
38	127	In striving towards the goal of food security, the agri-food sector needs to adopt sustainable agricultural practices to preserve environmental balance and ecosystems, ensuring that industrial growth does not significantly impact pollution and environmental degradation.
39	131	Losing food is one of the indicators under the 'Availability' category in the Global Food Security Index (GFSI). Therefore, it is important to strengthen the value chain of the country's agri-food sector to minimise food loss.
40	133	It is important to ensure that food producers practice sustainable agricultural practices to protect and preserve biodiversity. Biodiversity conservation is also important to ensure the resilience of food production and other agricultural products, as well as to maintain the benefits of biodiversity to humans, including food security, nutrition, and income sources.
41	143	The agri-food sector makes a significant contribution to the nation's food security. Therefore, it is important to ensure that the country's food value chain operates efficiently and effectively in a safe and secure environment. To achieve this, industry management practices need to be improved.
42	244	Facing the dynamic global and regional landscape that can have a significant impact on food security besides the challenge of changing perceptions about the agri-food sector as an important sector in national development, DAN 2.0 serves as a framework to unite all stakeholders to enable more integrated collaboration and contributions towards the advancement of the agri-food sector while addressing current challenges.
Budget 2023 Malaysia Madani		
43	100	Strengthening the Role of Government Agencies and Companies: Investment by Government-Linked Companies (GLCs) in food security projects (RM1.3 billion).
44	104	Food Security: Agrofood Financing Scheme (AF) by BNM with loans up to RM5 billion at an interest rate of 3.75%, including guarantees for up to 8 years (RM1 billion).
45	104	Food Security: Cooperative Revolving Fund for the supply of basic necessities, empowering cooperative supply chains, and business development programs by the Cooperative Commission of Malaysia (RM100 million).
46	104	Food Security: Management of appropriate technology and agricultural sustainability (RM9.4 billion).
47	104	Food Security: Crop and livestock development by the Perak State Department of Agriculture (IADA) (RM17.3 billion).
48	104	Food Security: Agricultural booster projects: high-value herbal product research grant scheme (RM21.4 billion).

49	104	Food Security: New clustered rubber planting (Sabah) - Phase 2 (RM50 billion).
50	104	Food Security: New Yield Reconstruction Development Program (RM40 billion).
51	104	Food Security: Oil Palm Planting or Sustainable Palm Oil Malaysia Certification Program (MSPO) for private smallholders (RM40 billion), Incentives for MSPO Certification (RM30 billion), Intensifying efforts to promote and Counter palm oil at the global level (RM10 billion).
52	104	Food Security: Cocoa Development Program (RM22.6 billion), Domestic Corn Grain Farming involving 70 acres of LTAT land.
53	105	Program to fertilise idle land owned by FELDA, FELCRA, and RISDA as well as agencies under the Ministry of Agriculture and Food Security (MAFS) with an area of 800 acres for food crop projects.
54	105	Food Security: Upgrading irrigation and drainage systems (RM126.8 billion).
55	105	Implementing agri-food projects in collaboration with several state governments (RM30 billion)
56	105	Food Security: Investment and Financing Fund by Agrobank: Agri-food Financing Fund - Working capital financing facility for agricultural SMEs (RM550 billion), Agri-food Value Chain Modernization Program (RM60 billion).
57	105	Food Security: Modernisation and Empowerment of the Pineapple Industry (RM29 billion).
58	105	Food Security: Pioneering sustainable farming projects using organic fertilisers by MAFS (RM5 billion).
59	147	This tax incentive applies to applications received by the Ministry of Agriculture and Food Security (MAFS) from January 1, 2021, to December 31, 2022.
60	117	Strategic collaboration between LTAT, MAFS, & KEMENTAH for the Pilot Project on Cereal Corn Farming.

This article screens quotes from three Malaysian government policy documents to analyse food security preparedness. The first document, the National Food Security Policy Action Plan 2021-2025, yielded 20 quotes. The second document, the National Agrofood Policy 2.0 2021-2030, provided 22 quotes. Lastly, the Budget 2023 of Madani Malaysia contributed 18 quotes. In sum, 60 quotes were extracted from these documents, highlighting the multifaceted approach and emphasis on food security within governmental strategies and budgets.

Table 4: Analysis of the selected Malaysian policy documents based on keywords.

Keyword	National Food Security Policy Action Plan 2021-2025	National Agrofood Policy 2.0 2021- 2030	Budget 2023 Malaysia Madani
Preparedness	24 mentions	9 Mentions	1 Mention
Food Security	60 Mentions	50 Mentions	8 Mentions
Food Supply	12 Mentions	10 Mentions	4 Mentions

Despite the primary focus of the selected government documents not being solely on food security preparedness in Malaysia, analysis using three main keywords - preparedness, food security, and food supply - reveals consistent mentions of food security preparedness in each document. Despite variations in focus, all three documents acknowledge the importance of preparedness in ensuring food security within Malaysia's national agenda.

Table 5: the themes developed with ai coding by atlas.ti.

Crisis management	Preparedness	Collaboration	Agriculture
Certification	Planning	Inter-agency	Food supply
Standard	Incentives Initiative	Role of government	SME
Assessment	Empowerment	Public-private partnership	Distribution system
Guidelines	Technology		
Act & regulations.			

The analysis conducted by ATLAS.ti identified four main themes in food security preparedness: crisis management, preparedness, collaboration, and agriculture. Each theme encompasses various factors that contribute to ensuring food security. These themes and associated factors provide a comprehensive framework for understanding and addressing food security preparedness, particularly in Malaysia.

DISCUSSION

After examining the three selected policy documents, namely the National Food Security Policy Action Plan 2021-2025, the National Agrofood Policy 2.0 2021-2030, and the Budget 2023 in general, preparedness is mentioned in each of these documents. There are 24 mentions in the National Food Security Policy Action Plan 2021-2025, 9 in the National Agrofood Policy 2.0 2021-2030, and 1 in the 2023 Budget. However, the National Food Security Policy Action Plan 2021-2025 touches the most on food security with 60 mentions, compared to the National Agrofood Policy 2.0 2021-2030 50 mentions and Budget 2023 with only eight mentions. This shows that the Ministry of Agriculture and Food Security in Malaysia is aware of the threat to food security, and many steps and actions need to be taken to ensure that the food supply in Malaysia is sufficient for all levels of society. Then, the National Food Security Policy Action Plan 2021-2025 mentions food supply 12 times, the National Agro-Food Policy 2.0 2021-2030 mentions it 10 times, and the Budget 2023 mentions it four times. Food supply is the most important thing in ensuring food security in Malaysia. The National Food Security Policy Action Plan 2021-2025 document lists many efforts and actions to ensure that Malaysia has sufficient, accessible, nutritious supplies for all levels of society.

Next, the analysis conducted by ATLAS.ti revealed four overarching themes in food security preparedness: crisis management, preparedness, collaboration, and agriculture. These themes encapsulate the key components necessary for addressing and mitigating challenges related to food security. The first theme identified is crisis management in food security, which entails a multifaceted approach that addresses various factors such as certification, standards, assessment, guidelines, and acts & regulations. Certification methods are essential to ensure that food items satisfy set standards, are safe, and are high quality [38]. These standards provide the specifications for food production, handling, and distribution. International organisations or regulatory authorities frequently establish them. Assessment mechanisms, like audits and inspections, help identify potential risks and ensure established guidelines are followed. Guidelines give stakeholders a framework for best food security and safety practices and enable them to manage emergencies more adeptly. Legislation and regulations serve as legal instruments to guarantee the observance of food security norms,

allowing the authorities to promptly address crises and mitigate their detrimental impact on the health and well-being of the broader population [36].

A few sub-themes emerged under the heading of 'preparedness' from the analysis of the documents. Food security preparedness encompasses a comprehensive strategy involving planning, incentives, empowerment, and technology. Planning is vital, requiring the strategic allocation of resources, policy formulation, and stakeholder coordination. Governments, NGOs, and communities must collaborate to address challenges effectively. Incentivising sustainable agricultural practices and food distribution can drive positive change, including subsidies for small-scale farmers and tax benefits for food donations [25]. Community-led efforts empower residents to address food security issues tailored to their needs, fostering ownership and sustainability. Education and training are vital for empowering individuals and communities to participate in decision-making and food production. Supporting smallholder farmers with market access and strengthening local food systems through initiatives like community gardens are essential. Technology plays a pivotal role, with advancements like precision farming and genetically modified crops enhancing productivity and resilience against climate change [14]. Food processing, storage, and transportation innovations reduce waste, ensuring more food reaches needy people.

The analysis from ATLAS.ti also found collaboration is essential for addressing complex issues like food security, which requires coordinated efforts across various sectors such as inter-agency, role of government, and public-private partnership. Inter-agency cooperation involves governmental departments, international bodies, and NGOs pooling resources and expertise to address food security comprehensively. Each entity contributes unique perspectives and capabilities, enriching the collective approach to combating food insecurity. The role of government is pivotal in facilitating collaboration. Governments establish policies, regulations, and frameworks to guide food security initiatives, ensuring agency coherence [2]. They provide essential funding, infrastructure, and support for programs to enhance food access, distribution, and production.

Furthermore, governments act as mediators, fostering stakeholder cooperation and resolving conflicts to achieve common goals. Public-private partnerships (PPPs) are instrumental in leveraging the strengths of both sectors to improve food security outcomes [37]. Private companies bring innovation, technology, and investment, while governments offer regulatory oversight, public infrastructure, and social welfare objectives.

The last theme identified is agriculture, which is pivotal in ensuring food supply, particularly for small and medium-sized enterprises (SMEs) and distribution systems. Food supply hinges on the efficiency and productivity of agricultural practices. SMEs, often comprising small-scale farmers and producers, contribute to food production. Supporting SMEs through access to resources, technology, and markets is crucial for bolstering the food supply [21]. Governments and organisations can assist, through training programs, access to credit, and infrastructure development, to empower SMEs and enhance their contributions to food production.

Meanwhile, the distribution system ensures equitable and efficient food supply chains [32]. This system encompasses transportation networks, storage facilities, and market mechanisms, crucial for minimising food loss and ensuring timely delivery to consumers. Governments are vital in enhancing distribution infrastructure, streamlining supply chains through policy implementations, and fostering initiatives promoting fair and inclusive food access.

Preparedness for food security can be achieved by ensuring the fulfilment of the four pillars of food security: availability, accessibility, utilisation, and stability, as outlined in the Global Strategic Framework for Food Security & Nutrition by the Committee on World Food Security [4]. Meeting these pillars indicates that a country's food supply is sufficient for the current and future generations. It aligns with Sustainable Development Goal (SDG) 2, which aims to end hunger, achieve food security, improve nutrition, and promote sustainable agriculture, as well as SDG 12, which focuses on ensuring sustainable consumption and production patterns.

The four pillars of food security play a crucial role in establishing a robust and sustainable food system that can meet the population's needs now and in the future. By addressing availability (having enough food),

accessibility (ensuring people can obtain food), utilisation (ensuring food is nutritious and safe), and stability (ensuring food access is reliable over time) [15], countries can build resilience against food insecurity and create a foundation for long-term food security. SDG 2 emphasises the importance of achieving Zero hunger by improving food security and promoting sustainable agriculture, while SDG 12 focuses on responsible consumption and production patterns to ensure environmental sustainability [41]. By integrating these goals and focusing on the pillars of food security, countries can work towards a future where food supplies are secure, sustainable, and able to support current and future generations.

Furthermore, we have many factors that contribute to the difficulty of achieving preparedness in food security such as Malaysia's dependence on imports of staple food items, such as rice, to meet local food needs is a concern due to low productivity and high costs [8], the country faces challenges such as environmental degradation, water shortages, and food waste, which impact food security [23], rising food prices and increasing food imports have contributed to higher household spending and less savings, affecting the economy [31].

Malaysia has made efforts to improve food security and sustainability, but the country still has not achieved 100% self-sufficiency in food security due to dependence on food imports and various challenges in the agricultural sector [8]. Through the National Food Security Policy Action Plan 2021-2025, many efforts and measures are planned to meet the four pillars of food security while also ensuring that the country's food supply is sufficient and that food security is in good condition.

Thus, considering the four themes identified from three primary government documents on food security, the government genuinely prioritises achieving sustainable food security. This is evidenced by the focus on crisis management to address food security, ensuring readiness to handle unforeseen situations amid current uncertainties. Simultaneously, the authorities must undertake integrated efforts and collaborate through a multi-sectoral approach. The agricultural sector must also not be overlooked when maintaining a stable and sustainable food supply.

In essence, Malaysia has a comprehensive strategy that encompasses well-thought-out plans and executed actions. However, the degree of its overall performance remains uncertain since this is the inaugural implementation of the National Food Security Strategy Action Plan 2021–2025. Once the plan is executed, the government should evaluate whether the plan is successful and effective. Based on observations, the emphasis on preparation in Food Security has not received much attention before, but only since 2021 has the government's concern for the food security issue that has plagued it, but it is still at a minimum level.

CONCLUSIONS AND RECOMMENDATION

Like many nations, Malaysia faces challenges in ensuring food security amidst global uncertainties, environmental changes, and socioeconomic shifts. With a rapidly growing population and increasing urbanisation, the country must proactively enhance its food security preparedness.

Among the suggestions that can be made to help Malaysia prepare for food security is to promote sustainable practices. Encouraging smallholder farmers to adopt environmentally friendly farming techniques, such as organic farming and agroforestry, improves soil health and biodiversity and contributes to long-term food security. Furthermore, supporting initiatives for efficient water management and reducing food waste are essential to a sustainable food system.

In addition, diversify food sources. Over-reliance on a limited variety of crops poses risks to food security, especially in the face of climate variability and pest outbreaks. Malaysia should encourage the cultivation of various crops that are resilient to changing climate conditions. In addition, initiatives to promote aquaculture and sustainable fishing practices can reduce dependence on imports for seafood, thereby strengthening the country's food diversity and security.

Strengthening the policy framework is also one of the efforts that can be made to achieve preparedness in food security [28]. Effective governance is fundamental to achieving food security goals. Malaysia should

enact policies prioritising food security, incentivising sustainable agricultural practices, and supporting vulnerable communities. Furthermore, fostering collaboration between government agencies, academics, industry stakeholders, and civil society can facilitate the implementation of comprehensive strategies to address food security challenges holistically.

Furthermore, the analysis of three documents regarding food security strategy in Malaysia reveals a comprehensive approach aimed at enhancing food security, bolstering the agricultural sector, and addressing challenges associated with crises and emergencies. These documents underscore the importance of collaborative efforts among various agencies, regulatory improvements, upgraded distribution systems, and technology integration into the food system to ensure a resilient and secure food supply chain.

One significant aspect highlighted in the documents is the emphasis on interagency cooperation. The documents advocate for improved collaboration mechanisms, recognising that effective coordination among governmental bodies is vital for successful implementation. By fostering stronger partnerships and communication channels between relevant agencies, Malaysia can streamline efforts and enhance the efficiency of its food security initiatives. Moreover, regulatory enhancements are a key focus area in pursuing food security [29]. The documents outline plans to strengthen existing regulations and enact new ones to ensure food products meet stringent safety standards. By enforcing robust regulatory frameworks, Malaysia aims to ensure consumer confidence in the safety and quality of its food supply, thereby safeguarding public health and well-being.

Another crucial aspect addressed in the documents is the modernisation of distribution systems. Recognising the importance of efficient supply chains in ensuring food accessibility and affordability, Malaysia plans to upgrade its distribution infrastructure. By leveraging technology and implementing logistical innovations, the country aims to enhance the efficiency of food distribution networks, reduce waste, and mitigate disruptions caused by emergencies or crises [1].

Furthermore, the documents underscore the significance of technology adoption in transforming the agricultural sector. By harnessing digital tools and innovations, Malaysia seeks to boost productivity, sustainability, and resilience in food production [12]. From precision farming techniques to advanced data analytics, technology holds the potential to revolutionise agricultural practices, optimise resource utilisation, and mitigate risks posed by climate change and other challenges [22].

In conclusion, the analysis of these documents underscores Malaysia's proactive approach towards enhancing food security. By prioritising initiatives to improve food security, empower the agricultural sector, and address crises and emergencies, Malaysia is laying the groundwork for a resilient and sustainable food system. Through collaborative efforts, regulatory enhancements, technological innovations, and strategic frameworks like DAN 2.0, Malaysia is poised to strengthen its food security resilience and ensure the well-being of its population in the face of evolving challenges.

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