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ABSTRACT

Self-sufficiency means the ability of a country to produce enough food for domestic needs, without needing to buy or import additional food for its people. Traditionally, this concept played a crucial role in measuring food security. But does self-sufficiency alone guarantee food security? This thought-provoking article argues that it doesn't and challenges its centrality in modern food security discourse. It explores the historical context and current policies focusing on self-sufficiency and argues for a broader understanding of food security beyond production-centric indicators.

Malaysia, being a net food importer, heavily relies on Self-Sufficiency Levels (SSL), predominantly for rice. The article calls for a shift in perspective away from an exclusive focus on rice production and towards a multidimensional approach to food security for Malaysia, encompassing availability, access, utilisation, and stability.

RETHINKING SELF SUFFICIENCY AS A MEASURE OF FOOD SECURITY

by **Anis Farhana, with Farhana Roslan**

Introduction

The recent announcement of a 36% increase[1] in imported rice stock in Malaysia has again renewed pressure on the country to aim for 100% rice self-sufficiency level and eliminate reliance on imports. Malaysia is currently between 60% and 70% self-sufficient in rice. This is not a new concept; self-sufficiency in a handful of basic food commodities – mainly rice – has long been Malaysia's primary food security strategy. The self-sufficiency level ("SSL") has been the key headline indicator of food security and is used on almost all food policy platforms, including the government's flagship policy document on food, the National Agrofood Policy 2021-2030 ("NAP 2.0").

However, it is important to remember that food availability is only one dimension of food security. Access to food, food utilisation, and stability of food supply (FAO, 2016), are three more dimensions that are equally significant. While the SSL has served as a simple and useful indicator for policy design and public understanding, this article aims to (i) *summarize* key justifications for an increasingly prevailing argument against Malaysia's singular policy focus on the SSL and (ii) *recommend* looking as deeply into three other dimensions that defines food security, as recommended by the FAO, supported by outcomes-based indicators, such as the Global Hunger Index ("GHI") and Global Food Security Index ("GFSI").

What is Self Sufficiency?

'Self-sufficiency' is the extent to which the supply of agricultural commodities in the country meets the domestic needs of the country[2], which is why the concept makes sense in the context of food security as a nation. Becoming "self-sufficient" – that is, the ability to locally supply as much food as it is demanded – has long been considered the policy imperative for food security. Self-sufficiency is captured by the SSL, also interchangeably known as the self-sufficiency ratio ("SSR"). It is the ratio of total domestic production to the total available supply in the country, measured by percentage, as depicted below:

$$SSL = \frac{\text{Production}}{(\text{Production} + \text{Import} - \text{Export})} \times 100$$

Figure 1: The calculation of SSL *(Source: FAO Statistical Pocketbook)*

By holding net imports constant, higher production can translate into higher SSL. This indicates lower dependency on imported produce compared to local produce, reducing the risk of supply shocks caused by external factors such as unfavourable foreign exchange or export bans from source countries. Consequently, a high SSL is thought to indicate a high level of food security.

An SSL level of 100% means perfect self-sufficiency, where a country would produce enough to supply for the whole nation's demand. Theoretically, this has been assumed to be an indicator to eliminate any uncertainty in securing access to an adequate supply of food, especially during unprecedented times of heightened risks of food insecurity[3].

Is Malaysia Food Secure?

Broadly speaking, Malaysia can be considered as only mildly food insecure, ranking 41st out of 113 countries in the Global Food Security Index (GFSI) 2022[4], especially when compared to Yemen and Haiti, the two countries found at the bottom of the list unsurprisingly due to violence, extreme poverty, and political turmoil.

Figure 2: *About 4.4 million people, 1.9 million of whom are children, are estimated to be food insecure in Haiti, May 2021 (Credits: Tony Savino-Corbis, Getty Images, UNICEF)*

Figure 3: *An 'eggs sold out' notice displayed at a wholesale shop in Seri Kembangan, October 2022 (Credits: Azhar Mahfof, The Star)*

The figures above juxtapose the consequences of extreme food insecurity in Haiti (Figure 2) with the impact of the kind of (milder) food insecurity experienced in Malaysia (Figure 3). Majority of Haitians suffer from at least moderate, if not severe acute malnutrition ("SAM"),[5], whilst the worst Malaysians have experienced is a milder—yet still unsettling—situation of having ocassional food shortages.

Based on the SSL approach, to be food secure is to have the capacity to feed the entire population adequately, even in the events of war, geopolitical unrest, natural or climate disasters, or any other possible circumstance that might affect the supply of imported produce. This is especially true historically, when international food trade was not as prevalent, leaving countries with no choice but to adopt policies that are production- centric.

Thanks to trade, local production has now become a less significant component of the food we eat today. Malaysia is a net food importer, with roughly 60% of our food needs being imported in 2020, according to trade data from the Department of Statistics Malaysia (DOSM)[6]. Therefore, Malaysia can hardly be considered "self-sufficient" from the lens of trade, but this does not necessarily imply that Malaysia is food insecure. This points to why food security must be looked at more broadly, beyond the ability to sufficiently produce what we need locally. A case in point is Singapore, which imports approximately 90% of its food (Malaysia: 60%)[7] and yet, comfortably ranked 28th (Malaysia: 41st) in the GSFI food index rankings in 2022.

The Supply & Utilization Accounts ("SUA") for agricultural commodities tracks the SSLs of some 45 other agricultural commodities1 spanning three (3) categories, namely crops, fisheries, and livestock. However, a less official yet deeper underlying focus on rice is hard to ignore. There appears to be a constant feature of policy initiatives around rice in most of the authors' past engagements with the Ministry of Agriculture and Food Security ("MAFS"), which is also echoed by public reports and commentaries [8] [9].

While the NAP 2.0 itself does not officially commit to a specific rice SSL, it does make bold projections that Malaysia would achieve a rice SSL of 75% by 2025 and 80% by 2030[10]. To achieve these SSL targets, the strategy relies on the modernisation of farm practices, which is again, production-centric. This suggests continued preoccupation with rice SSL targets, consistent with past National Agricultural Policies (NAPs) and the previous National Agro-Food Policy ("NAP 1.0").

Figure 4: *Painting of food rationing featuring rice during the Japanese Occupation, 1942 (Credits: National Museum of Singapore)*

Jomo et al. (2019) attribute this emphasis on rice to historical factors including the collective memory of rice shortages and undernourishment under the Japanese Occupation during World War II, legacy foreign exchange management policies of the colonial authorities, and an episode of a spike in the price of cereal globally (including rice) in 2008. Malaysia is not unique in its commitment to these outdated interpretations of food security policy[9].

Evaluating Self-sufficiency in Practice and for the Future

Considering the focus on SSL targets, it is hard to consider the first NAP 1.0 as successful, observing virtually no improvement for rice SSL and a decline in the SSL for most major food categories, namely fruits, beef, poultry, and fish, as shown in the table below:

Commodity	SSL (2010)	NAP 1.0 (2010 – 2020)			NAP 2.0 (2020 – 2030)	
		Past SSL Targets	Actual SSL Achieved (2020)	Actual CAGR	Current SSL Targets	Targeted CAGR
Rice	63%	100%	63%	+0.0%	80%	2.4%
Fruits	84%	107% 8	0%	-0.5%	83%	0.4%
Vegetables 5	0%	95%	52%	0.4%	79%	4.4%
Beef 3	0%	50%	22%	-3.2%	50%	8.7%
Poultry Meat	106%	104% 1	05%	-0.1%	140%	3.0%
Poultry Egg	115%	130%	117% 0	.2%	123%	0.5%
Fisheries	95%	96% 9	4%	-0.2%	98%	0.5%

Figure 5 : *Actual and Target SSLs for selected basic foods for NAP 1.0 and NAP 2.0, Malaysia, 2010–2030 (Source: NAP 2.0, MAFS)*

Despite the underwhelming performance, MAFS is still optimistic about increasing SSLs under the NAP 2.0, albeit at more realistic targets, as listed above. Nonetheless, the leap required to achieve these SSL targets by 2030 is massive, compared to historical track record.

For example, production of rice is expected to grow at an average rate of 2.4% annually, when it had hardly grown in the last 10 years. In spite of equally optimistic targets for other food commodities, MAFS appears to exclusively approach rice production. The bet appears to be on novel efforts to revolutionise the rice industry, such as the Large-Scale SMART Paddy Field ("SMART SBB"), that is expected to "end the country's reliance on imported rice within two years (from 2023)"[11] which is modelled based on the high-yielding Sekinchan area (between 7 and 12 tonnes per hectare (ton/Ha) of paddy), compared to the national average yield of 4.2 ton/ha. Again, the bet is on rice, and on producing more of it.

Sufficiency does not Mean Security

There are four dimensions to food security, as outlined by the Food and Agriculture Organisation ("FAO"), a United Nations agency. They are: (i) availability, (ii) access, (iii) utilisation, and (iv) stability. Self-sufficiency, in its construct and definition, is a target that is focused only on the "availability" dimension. We outline three arguments as to why self sufficiency is not enough, and how the focus on it dangerously ignores the other three dimensions.

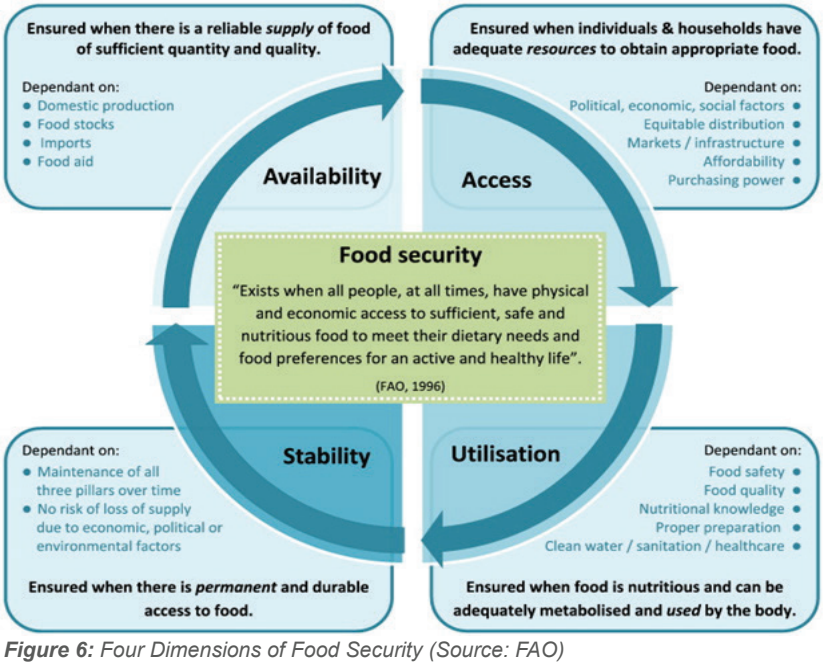

Figure 6: *Four Dimensions of Food Security (Source: FAO)*

Firstly, to begin with, the goal of self-sufficiency as a target does not even completely address the 'Availability' dimension of food security. Technically, even under a best-case scenario of having (i) sufficient domestic production to meet population demand and (ii) sufficient food inventory (from imports or excess production), the ability to secure a food aid programme as a fail-proof measure may not be in place. Such a programme would require a geopolitical level of cooperation, which is a policy component that can never be identified if the mental framework continues to focus on SSLs and domestic production.

Secondly, this notion of self-sufficiency can be challenged by contrasting countries' self-sufficiency levels with their respective performances in the Global Food Security Index (GFSI) and the Global Hunger Index (GHI).

Country	Income Level [2]	2022 GFSI Ranking	Food Supply Adequacy	Prevalence of undernourish-ment	Human Development Index	SSL Status & Prevailing Policies
JAPAN	High	6th	41.3	3.2%	0.92	Current SSL: **38%** (2021) Target SSL: **45% (**by 2030)
SINGAPORE	High	28th	69.8	No data	0.94	Current: Food Imports > **90%** Target: **30%** production of nutritial need (by 2030) under "30 by 30" programme
MALAYSIA	Upper middle	41st	52.4	2.5%	0.81	Current Rice SSL: **63%** (2020) Target Rice SSL: **80%** (by 2030) NAP 2.0
INDONESIA	Lower midddle	63rd	61.9	6.5%	0.72	Current: Self Sufficient in rice (since 2022) ** Rice self-sufficiency became part of national food strategy in 2014*
THAILAND	Upper middle	64th	44.4	8.8%	0.78	Current: Have **exceeded 100%** SSL for staple and important food items
INDIA	Lower middle	68th	39.7	16.3%	0.65	Current: Has long surpassed self-suf-ficiency levels *World largest rice exporter, and among world's largest producer of wheat, other crops*

Figure 7: *GFSI 2022, GHI 2022, for select countries (Source: PNBRI analysis, The Economist Impact, Ministry of Agriculture & Food Security, Japan Ministry of Agriculture, Forestry and Fisheries, Singapore Food Agency, International Rice Research Institute, The Nation, Knowledge at Wharton)*

Data on selected countries depicted in Figure 6 reveals a major paradox; that "self-sufficient" countries tend to be more food insecure and hungry, while countries that depend significantly on imports tend to be more food secure and less hungry. Supposedly "self-sufficient" countries like Indonesia, Thailand, and India, are faring relatively poorly in the GFSI ranking and recording higher incidences of hunger. The supply crunch for chicken, beginning September 2021[12] also sheds light on the fragility of Malaysia's chicken supply, particularly to imported farming inputs such as imported chicken feed, despite Malaysia having officially achieved an average of 105% SSL in poultry over the last decade.

[2] Country Income Levels is based on classification GFSI, The Economist Impact

Figure 6 above also demonstrates how nations with high degrees of self-sufficiency, such as India and Thailand, may experience lower levels of Food Supply Adequacy[3], while a country like Singapore, which imports most of its food, is able to experience relatively higher levels of Food Supply Adequacy and almost no hunger or malnutrition. India, despite being the world's largest rice exporter, scores the lowest out of these six countries for the Food Supply Adequacy indicator. Food production may be extensive in countries like India, but if 'Access' and 'Adequacy' are not equally made as important as 'Availability', national food security may still well be under threat.

It is worth noting that while Singapore and Japan continue to commit to increasing their respective SSLs, self-sufficiency is not their primary national food security strategy. While Malaysia has different and unique considerations in terms of self-sufficiency compared to Singapore and Japan, it may be worth taking a leaf out of their books.

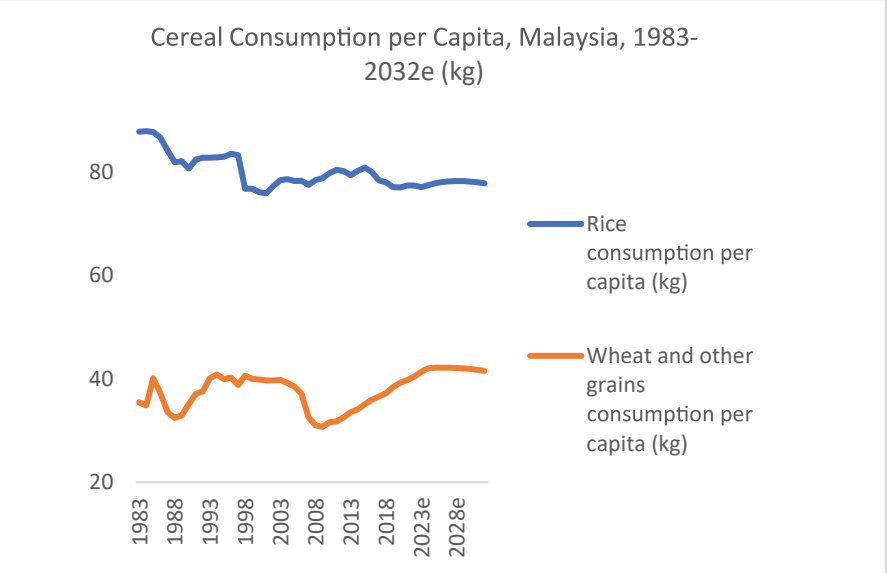

Figure 8: *Cereal (rice, wheat, and other grains) consumption per capita, Malaysia (1983-2022) and forecasted cereal consumption per capita, Malaysia (2023e – 2032e) (Source: OECD-FAO Agricultural Outlook (various years)[13])*

While rice will always be Malaysia's main source of carbohydrates, this position has been slowly but steadily counterbalanced by wheat and other grains. In Figure 8, historical (1983-2022) and forecasted (2023e – 2032f) data show that 'Rice' consumption per capita has decreased by 10kg over the last four decades, while 'Wheat and Other Grains' consumption per capita has increased by 6kg. Contemporary research attributes this shift away from rice towards wheat and other grains to increasing household income[14], and health awareness [15]. This further supports why food security must be seen as a multidimensional issue, rather than focusing on the upstream production of rice, not least because of changing consumer preferences and the likelihood of Malaysia ever achieving 100% rice SSLs.

Thirdly, and finally, consider how contemporary indicators of hunger and nutrition have deteriorated despite the SSL targets that have been in place. Malaysia's position in the Global Hunger Index ("GHI") has increased from 10.9 in 2014 to 12.5 in 2022[16]. While this level is still classified as "Moderate", the trend reflects a worsening state of hunger. Among the four indicators of GHI[4], Malaysia performed worst in the incidence of child stunting, increasing from about 18% to almost 22% from 2014 to 2022 among children under five[16]. This is significantly higher than the average 8% in its peer group of upper middle-income countries[5] [4]. This trend reflects deteriorating nutritional state of Malaysian children, despite a backdrop of relatively stable rice SSLs[6].

[3] 'Food Supply Adequacy' measures the adequacy of food available for human consumption as a percentage of the average

[4] Four indicators of GHI include: (1) child stunting, (2) child wasting, (3) child mortality, and (4) undernourishment [16]

[5] The GHI referred to the child stunting rate published by the United Nations Children's Fund (UNICEF), the World Health Organization (WHO) and the World Bank [30]

[6] The SSLs of rice, vegetables and poultry have improved between 2010 and 2020, while the SSLs of beef, pork, and fruits have declined over the

To be fair, there are complementing policies such as price controls and consumer subsidies aimed at improving economic 'Access', which is one of FAO's three other dimensions of food security. However, these two policy approaches may not have been coordinated along the same thinking process, perhaps because strategy on food security has always been solely focused on SSL and farmers' livelihoods at best, which are important but still production-focused. Meanwhile, consumer 'Access' to food is put under the purview of separate policy domains, like domestic trade or consumer protection. This led to persistent market distortions that have now become too challenging to unravel.

One example of such market distortions is in the case of the paddy and rice industry. At one end of the supply chain, a Guaranteed Minimum Price ("GMP") and input subsidies for farmers are put in place to push up paddy SSLs, while at the other end of the supply chain, the price of processed rice is controlled to protect end customers[8]. What ensues is a tricky situation where the government has to step in to heavily subsidise paddy farming, while many small-to-medium independent millers, wholesalers, and retailers face serious pressures on both cost of buying paddy inputs and price of processed rice outputs. This is yet another illustration how omitting, or separately considering, other dimensions of food security will render self-sufficiency alone pointless.

Multidimensionality as the only Way Forward

Perhaps the time has come for Malaysia to make peace with our 60 to 70% range of rice SSL and start investing more time and resources on translating production into better access, better nutritional absorption and consumption, and better planning so that the population not only survives in the face of external shocks to food supply, but can also thrive under stable and sustainable access to nutritious food. Malaysia must transition towards a more comprehensive yet practical food security strategy by adopting a more multidimensional perspective – among others, the use of contractual farming from both domestic and imported sources, diversification of import source countries, and robust risk management practices for incidental costs of import such as freight and foreign exchange.

Like all other complex issues the country is facing in the coming decades, a whole-of-society approach is extremely crucial, but the Government must initiate this transition by first beginning to review the SSL and production-focus strategy on food. Such review needs to be considered alongside:

(i) **A broader set of indicators** of food security; such as GHI, GFSI, FAO's four dimensions, among others;

(ii) **Existing incentive structure**s that have resulted from the policy suite around food that are in place today – namely quotas, price controls, subsidies and grants, and;

(iii) **A cross-ministerial and cross-sectorial approach** to food security, beyond agriculture, and into urban planning, rural development, and foreign policy, among others.

Such multidimensionality will require a lot of coordination and persistence, but is our only hope to better address the issue in its essence, rather than reducing a large issue into simple yet problematic statistic such as the SSL.

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