



# Food Reserve Management and Policies in Southeast Asia<sup>1</sup>

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Food availability is an important dimension of a country's food security. At the regional level, the latter requires a balance between food production and trade. In Southeast Asia, "rice security" is generally equated to food security. Hence, rice is a good starting point for analyzing food reserve management and policies in the region. For many millennia, public stockpiling has been a popular strategy adopted for mitigating instability in the food supply. Building up of reserves has been a common component of food policies around the world. This policy paper, which draws substantially from the findings of the research project "Food Reserves: A Comparative Study on Food Reserve Management and Policies in Southeast Asia," compares the experiences and challenges in public food stockpiling of selected Southeast Asian countries, and provides actions and recommendations on how to make food stockpiling a viable strategy toward achieving food security at the national and regional levels.

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## Introduction

Food availability in the context of food security has been a longstanding topic. For Asia, where most of the world's population resides, it is the undeniable responsibility of governments to assure sufficient food supplies. However, being able to continually feed their burgeoning populace is a perpetual challenge for governments. Thus, ensuring a steady supply of food has been a common component of many food policies across the region.

In Southeast Asia, the main sources of food are what Teng (2013) has called “food taps,” which comprised of self-production, imports, contract farming, stocks and reserves, and food aid. Anecdotal information shows that countries stockpile food, particularly rice, in different modalities. To maintain a supply of rice stocks for the population, most countries in Southeast Asia adopt a mix of trade instruments such as government-to-government (G2G) trade, local procurement, and procurement through the private sector. Thus, rice is a good starting point to study food reserve management and policies in Southeast Asia.

Given the potential role that stocks and reserves can play to stabilize food availability at the individual country and the regional level, it is important to research the policies, processes, and technologies

that allow this to be a viable strategy in the region. The Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), in partnership with the University Consortium, conducted a study in eight Southeast Asian countries, namely, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Thailand, and Vietnam, to provide an in-depth analysis on the role of food reserves in achieving food security in the region.

## Overview of Food Stockpiling

### *Definitions*

**Stocks** is defined as “the quantities of a commodity held in storage by any of the various agents along a supply chain, from farmer to consumer, at an instant in time” (Abbott 2013). Stocks are categorized based on which agents hold them, why they are held, and what purpose they ultimately serve. One key distinction that needs to be drawn is between working stocks and reserves. Working stocks or pipeline stocks refer to those held by agents, such as a food processor or a livestock feeder, to ensure continuous operations. **Reserves**, on the other hand, refer to those stored in excess of the working stocks. These stocks are often held to influence market outcomes or maintain food supplies across crop years (Abbott 2013).



Reserves can be further classified depending on their purpose. Caballero-Anthony et al. (2015) identified three types of stockpiles, which are as follows:

1. **Public stockpiles.** Directly owned, monitored, and administered by government via state owned enterprises.
2. **Private stockpiles.** Exclusively/completely owned by private enterprises but can be monitored and co-administered by private owners and the government.
3. **Household stockpiles.** Directly owned by the consumer/small producer but monitored to some extent by the government.

Caballero-Anthony et al. (2015) further categorized public stockpiles into four types, to wit:

1. **Emergency/humanitarian stocks.** Maintained to protect access to food especially for vulnerable groups in the event of food shortage during emergencies.
2. **Buffer stocks.** Stocks for food security used to ensure stability in the availability and price of food.
3. **Safety net stocks.** Targets certain groups or beneficiaries based on defined poverty lines and are intended to improve availability and access for population who suffer from chronic food security.
4. **Stocks for trade.** Those that are held by exporting countries.

### Public Stockpiling in Southeast Asia

Public stockpiling has been a common go-to strategy for mitigating food supply instability. This type of food policy has been adopted even as far back as the time of the World Wars (Caballero-Anthony et al. 2015). Maintaining food reserves is viewed as a practical and forward-looking strategy for governments in dealing with food security issues. It has been a prevalent practice in Asia, which does not only suffer from chronic hunger, but is also caught in an era when natural disasters and calamities have become frequent and unwanted guests (Daño and Peria 2006).

In most of the Southeast Asian countries, rice remains the most publicly stockpiled food commodity. However, countries such as Thailand, Vietnam, Cambodia, and the

Philippines have also established other forms of food reserves. Among them, Thailand currently stores the most number of food commodities including fruits, vegetables, and meat products.

This is a testament of the country's strong agricultural production capacity and self-sufficiency. Vietnam, on the other hand, maintains a more diverse public reserve, covering both food and non-food products for specific purposes.

The establishment of such public stockpiles usually aims to mitigate several risks faced by the food insecure and vulnerable populations. These risks include: (1) global food price shocks, (2) local supply shocks, (3) income shocks, (4) disruptions in trade, and (5) emergencies and calamities (Caballero-Anthony et al. 2016). For the countries studied, the rationale behind their decision to stockpile food showed very little variation. Price stabilization and food availability are usually on top of the list. Other reasons cited include exports, national security and contribution to regional reserves, such as the ASEAN Plus Three Emergency Rice Reserve (APTERR).

For Thailand and Myanmar, stockpiling is mainly for trade and market control as both countries are known to be surplus producers of rice. Thus, there is no pressure to formulate specific policies on food reserves. In the case of the other countries, ensuring that there is available food during emergency situations (e.g., natural disasters) is a top priority, especially for the rice-importing countries.



## Initiatives on Food Reserve Management

Not all countries have their own specific food reserves policies. It appears that the large rice-importing countries, the Philippines, Indonesia, and Malaysia, have more defined food stockpiling initiatives and strategies, primarily for rice. Moreover, the overall management of their stocks is under specific agencies created or tapped by the government for this sole purpose. These are National Food Authority (NFA) for the Philippines, Bureau of Logistics (BULOG) for Indonesia, and *Padiberas Nasional Berhad* (BERNAS) for Malaysia. For Cambodia and Lao PDR, food stockpiling initiatives are still in the early, development phase.

Majority of the laws on food reserves for these countries were enacted by the national government except for Malaysia, where the agriculture ministry was the entity to formulate the policy. Table 1 presents a summary of major food stockpiling policies in Southeast Asia.

**Table 1. Major legislation on food reserves in selected SEA countries**

Country	Legislation	Proponent	Year
Vietnam	Law on National Reserve	National Assembly	2012
Cambodia	Sub-Decree on the Establishment of Cambodia Food Reserve System	Royal Government of Cambodia	2012
Philippines	Presidential Decree No. 4	President of the Philippines	1972
Indonesia	Republic Bill No. 18 on Food	President of Indonesia	2012
Malaysia	National Agri-Food Policy	Ministry of Agriculture and Agro-Based Industry	2012
Lao PDR	Accumulative Stock Implementation Agreement	Prime Minister of Lao PDR	2014

Source: Country reports

Moving on to the actual practice of food stockpiling, the mechanisms and modalities on which rice is being stored varies widely among these countries. Some required fixed volumes while others based their quotas on previous experiences. Vietnam, Malaysia, and Lao PDR have set fixed levels of rice reserve requirements at 500,000 MT, 150,000 MT, and 5,000 MT, respectively. For Cambodia, the reserve must be equivalent to one month rice consumption requirement of 10 percent of the country's population. As for Indonesia, the *Cadangan Beras Pemerintah* must be 10 percent of the total national reserves. In the case of the Philippines, there are two types of rice stockpiles, one is the Strategic Rice Reserve (SRR), which is equivalent to 15 days consumption, and the other is the Government Rice Buffer Stock, which is a 30-day buffer stock inclusive of the SRR. For Thailand, it has been suggested that the optimal amount of rice stocks to be kept is 2 million MT.

For infrastructure, Vietnam, the Philippines, and Indonesia are reported to have large numbers of facilities for rice and other food commodity storage and distribution. The Philippines and Indonesia currently have more than 400 warehouses each, under NFA and BULOG, respectively. Vietnam, on the other hand, has a total capacity of four million tons spread across its provinces.

To ensure effective stockpiling practices, countries have been intensifying their R&D initiatives as well as technological advancements to modernize the process. A major concern is the preservation of food quality during long storage, and Vietnam seems to be taking the lead on this. The country is already strengthening its R&D programs in relation to food stockpiling, as well as on the use of advanced technologies and sciences. In Indonesia, the so-called "controlled atmosphere storage" is being explored for a technological advance.



For Thailand, the focus is on rice research. A number of government and non-government agencies engage in data collection, knowledge sharing, and information dissemination through the conduct of the biennial national rice conference.

These countries have likewise employed several good practices in relation to food reserve management and stockpiling. Thailand and Indonesia are more concerned about market activities. Thailand schedules release of stocks based on the prevailing domestic and international demands. An example would be delaying sales to Muslim countries during the Ramadan. Indonesia, on the other hand, came up with the so-called *Toko Tani Indonesia* or the Indonesian farmers' store, which aims to cut short the current agricultural trading system, which usually involves seven to nine agents, to as low as three. The main purpose of this initiative is to lower the prices of commodities by allowing direct shipments of products from manufacturers to the market.

Vietnam, the Philippines, and Malaysia are more focused on storage and distribution of public reserves. In Vietnam, the government is considering converting 10–20 percent of the National Reserve into cash to reduce the costs incurred in quality preservation of the goods stored. The Philippines, through NFA, strategically locates its warehouses for

even distribution of stocks across the country and for ease of access during times of emergencies. Malaysia performs regular restocking every six to eight months to ensure that the quality of the rice stored is maintained. The principle of “rolling stock” is applied and stocks that were stored beyond the six to eight months are considered “matured.”

Yet despite efforts to efficiently manage food stockpiles, the issue of climate change has proven to be a major barrier, especially as reflected in the frequency of unexpected severe weather events. These not only affect production, but also postharvest activities such as storage. Countries such as Thailand, Vietnam, and Indonesia have been implementing risk mitigation strategies to reduce the impact of climate change. For Thailand, a seed program is being implemented as a support scheme to farmers. Vietnam, on the other hand, is focused on modernizing its food preservation technologies. For Indonesia, a policy was formulated in 2011 to respond to the impacts of climate change on agriculture. Presidential Instruction (PI) No. 5 otherwise known as “The Safeguarding of National Rice Production in the Face of Extreme Climate” was enacted by the government to protect national rice production and prepare countermeasures to anticipated impacts.

Another major factor to consider in relation to food reserve management and policies is the changing regional trade regime. According to the General Manager of the APTERR Secretariat, the ASEAN Trade in Goods Agreement (ATIGA) has implications for the region's food reserves, more specifically on APTERR. He explained that despite its goal of promoting trade liberalization in ASEAN, not all countries are exempted from tariff and non-tariff barriers when it comes to trading rice under ATIGA. This could make ASEAN countries vulnerable to rice price volatility and could undermine food security. However, he clarified that ATIGA allows stockpiling of rice if the stocks are to be used for emergency purposes. Thus, the implementation of the ATIGA does not directly affect food stockpiling as long as APTERR continues to operate as an emergency reserve, and that national reserves operate at market prices.

In addition to these, Malaysia emphasized the need for regional stockpiles to complement existing policies to avoid duplication of work. It was also cited that there should be a mechanism where domestic producers are protected as the region moves toward a freer market. Vietnam, on the other hand, called for greater collaboration between the rice surplus countries and the rice deficit countries in creating a more effective trade regime among them. A good start would be through information-sharing among the ASEAN members. In addition, the Philippines encouraged its

neighboring rice exporting countries, such as Myanmar and Cambodia, to grant the country more access to their rice supply. This is to enable the Philippines to maintain a reasonable price of importing rice.

### Key Issues and Challenges in Food Stockpiling

The following are common issues and challenges faced by Southeast Asian countries in relation to food stockpiling:

1. **Fiscal burden.** Food stockpiling is a costly practice. From procurement to storage and distribution to stock rotation/replenishment, maintaining food reserves requires a huge budget. To illustrate, a 2011 study by Action Aid cited that the cost of holding grain stocks can be as high as 15–20 percent of the value of the stock per year. This varies among countries depending on the size of operations. For instance, in 2006, between the Philippines, a major rice-importing country, and Thailand, a top rice exporter, storage costs accounted for 27 percent and 8 percent of total marketing costs, respectively. A total of PHP 0.34/kg of rice would have been saved by the Philippines if the country has the same modality of stockpiling as Thailand. Among the major marketing cost components, transportation captures the bulk of expenses, accounting for more than 40 percent for both the Philippines and Thailand (Table 2).

**Table 2. Comparison of rice marketing costs in Thailand and The Philippines, 2006**

Activity	Philippines (PHP/kg)	Thailand (PHP/kg)	Differential (PHP/kg)
Transport costs	0.70	0.40	0.30
Drying costs	0.14	0.15	-0.01
Storage costs	0.42	0.07	0.34
Milling costs	0.32	0.23	0.09
<b>Total marketing costs</b>	<b>1.58</b>	<b>0.85</b>	<b>0.72</b>

Source: The World Bank (2012)

Furthermore, the cost of stockpiling was found to be the same or even higher than expenses on agricultural research and other agricultural programs (World Bank 2012). This concern is clearly depicted in the status of public spending on stocks among selected countries in Asia as presented in Table 3. With regard to the Philippines, spending on public stock programs was found to account for about 0.4–1.0 percent of the GDP as compared to other agricultural programs (0.8%) and agricultural R&D (0.05%) within the 2005–2009 period. These results reveal the high opportunity cost associated with stockpiling in the country and only pointed out the need for the government to look into the current stockpiling system and more importantly, the necessity to put long term investment in improving agricultural productivity and the marketing system. For Indonesia, although public stock spending was seen to be higher than the Philippines, it is just the same as expenditures on agricultural R&D and lower than spending on agricultural programs.



**2. Weak stock monitoring and information systems.**

To properly account for, and monitor food stocks, there has to be an effective monitoring system.

However, almost all countries, with the exception of the Philippines, share the same issue of weak inventory monitoring. In order to effectively monitor the supply and usage of food stocks, countries have to establish a system for data collection. Since this would require additional budget, manpower and updated technologies, most countries are having difficulty creating such systems. For countries without existing policies on food stockpiling, formulation of such policies is needed.

**Table 3. Comparison of public spending on stocks in selected countries**

Country	Legislation	Proponent	Year
	[A]	[B]	[C]
India	1.0% (2004/05) to 1.5% (2008/09)	1.2% (2008/09)	0.06% (2008/09)
Indonesia	0.5% (2008-10)	0.8% (2008)	0.05% (2003)
Philippines	0.4% (2005/06) to 1.0% (2009)	0.8% (2005)	0.06% (2002)

Source: World Bank (2012)

Note: Data on public expenditure on public stocks [A] for India are from Rhee (2011), Dawe et al. (2011), and government statistics; for Indonesia from Rhee (2011); for the Philippines from the World Bank (2007) and Rhee (2011); and for Zambia from IMF and Nkonde et al. (2011). Spending on agriculture [B] is from World Bank country reports and government statistics. Spending on agricultural research and development [C] is from Pardey et al. (2006) and World Bank country reports (Table excerpt from World Bank [2011] study)



3. **Low storage capacity or inadequate infrastructure.** For large rice producers, lack of storage facilities is a huge problem. Countries like Thailand, Vietnam, and Cambodia are some of the examples. Building such facilities will require a huge chunk of government budget. Hence, some countries are forced to tap the support of the private sector. On the contrary, some of the rice importing countries are underutilizing their storage facilities owing to supply shortages.
4. **Mismanagement and lack of cooperation among stakeholders.** Some countries cited improper management of publicly-provided equipment. Others pointed out the presence of red tape, too much government intervention, as well as politicization of commodities especially rice, which is prone to corruption. There is also a need to build the capacities of the people assigned to manage and monitor stocks. This is to ensure proper handling of commodities and reduce wastage.
5. **Lack of research and innovation.** There is limited research done on food reserves. Proper preservation of food commodities to maintain quality requires technological advancements and research. Failure to invest in such technologies may result to high levels of food wastage. This would likely reduce the country's competitiveness in the marketplace owing to failure in meeting certain quality standards.

### Proposed Actions and Recommendations

Given the preceding major issues discussed, the following are some recommended courses of action:

1. **Establish or upgrade data and monitoring systems.** Governments need to allocate budget to create or improve the existing stock monitoring systems to assist them in formulating evidence-informed policies and ensuring proper management of food reserves. Countries could also form a regional food (rice) reserve or stockpile data bank to encourage transparency and build trust among members. This could also allow governments to forecast the demand and supply of goods, determine the level to produce, and be able to propose the optimal volume of food reserves to keep.
2. **Revisit and evaluate existing policies.** For countries who already have existing policies on food reserves, there is a need to revisit and evaluate these in order to determine the appropriate level of government intervention needed to properly manage stocks and market shocks.
3. **Strengthen management practices.** The government should invest in strengthening the capacities of the people involved in food reserve management. Cooperation among all relevant stakeholders must also be encouraged. There is also a need to shorten the administrative process for the movement and release of food stocks especially during emergencies.



For instance, the members could increase the discretionary authority of the APTERR general manager in relation to the release of the rice stocks in times of emergencies and other unforeseen events.

4. **Encourage investments in infrastructure.** This is particularly true for the huge rice-producing countries. The government must invest in building or upgrading infrastructure facilities for storage and preservation of food stocks. This would significantly reduce wastage and inefficiencies in storage. The government could consider engaging in public-private partnerships (PPPs).
5. **Modernize processes and technologies.** There is a need for countries to modernize their processes and adopt new technologies in food stockpiling, mainly with regard to food preservation. This will also be a way to increase the competitiveness of exporting countries in the regional and global markets by meeting standards on food quality.
6. **Create other forms of stockpiles.** Countries should consider the creation of other stockpiles for food items besides rice. With all the complexities involved in rice stockpiling, the feasibility of establishing other types of reserves is currently being considered. Some countries have already begun this practice, but most initiatives are still in the early stages.

Researchers from selected Southeast Asian countries came up with a set of criteria for the selection of other commodities that can be stockpiled in the ASEAN region. These are:

- Strong domestic demand
- Regularly consumed/staple food
- No substitutes in terms of preference and affordability
- Easy to store and process
- Land availability
- Has high yield/production volumes
- Can be planted in majority of the country areas

Given these criteria, the following food commodities were identified as potential sources of stockpiles:

- Maize
- Sugar
- Soybean
- Wheat
- Cassava
- Taro
- Palm oil



Table 4 presents the top three priority commodities with their corresponding ASEAN producers and the possible type of public stockpile that can be established based on the deliberation of the workshop participants.

**Table 4. Priority commodities for public stockpiling in ASEAN**

Food Items	Local Producers	Type of Public Stockpile
Maize	Vietnam, Philippines, Thailand, Lao PDR, Cambodia, and Indonesia	Buffer stock (price stability) Safety net
Sugar	Vietnam, Philippines, Thailand, Lao PDR, Cambodia, and Indonesia	Buffer stock (price stability) Safety net (country's decision)
Soybean	Philippines, Cambodia, Thailand, Vietnam, and Indonesia	Buffer stock (price stability) Safety net

Source: Country reports

- 7. Provide support to the agriculture sector.** Food stockpiling will not be viable without a functioning and productive agriculture sector. Therefore, it is a must for governments to provide support to agriculture. This could be in the form of subsidies, loans, or policy reforms that would enable producers to operate effectively and competitively.



## Conclusion

Empirical evidence showed that across Southeast Asia, the primary food commodity being stockpiled in the region is rice, given that it is a staple food for most of the population. There was minimal variation observed regarding the rationale behind food stockpiling in Southeast Asia, with countries citing food availability during emergencies and price stabilization as major concerns. The mechanisms by which food is being stockpiled differs from country to country. Some countries depend on domestic production, while others engage in government-to-government trade, importation or even government-to-private trade.

Increasing urbanization and diversifying diets brought about by the region's strong economic performance has raised the need to establish other forms of food stockpiles besides rice. Yet despite the numerous benefits that food stockpiling provides, the financial burden that this activity entails has constrained other Southeast Asia countries to formulate policies or programs specific to food reserves. For the rice exporting countries, there seems to be no immediate pressure to establish food reserves since most of them

are already rice self-sufficient. As for the rice importing countries, most of them are intensifying efforts to achieve rice self-sufficiency. However, for a region known to be prone to natural disasters, Southeast Asian agriculture is often at risk and vulnerable. This raises concern for countries outside the region who are dependent on rice imports. Unstable supply of rice in the region could cause price fluctuations and even food crises.

Thus, with ASEAN's move towards building a common, competitive market, Southeast Asian countries could support each other in terms of ensuring food availability across the region through stronger intra-ASEAN trade. For instance, rice surplus countries can offload their excess supply into neighboring deficit countries and reduce storage and preservation costs. Deficit countries, on the other hand, can focus more on achieving food security rather than aiming for food self-sufficiency, which is an obviously harder, and more expensive "fish to catch."

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