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Technical Report

Singapore's Food Security Policy: Evolution, Framework and Outlook

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Executive Summary

Singapore imports more than 90% of its food yet consistently ranks among the world's most food-secure nations. This report traces how six decades of policy evolution produced that outcome and analyses the current policy architecture.

Since independence in 1965, Singapore's food security strategy has undergone five major transformations, each triggered by an external shock rather than by incremental planning: the agricultural survival phase (1965–1985), de-agriculturalisation (1985–2007), post-crisis institutional rebuilding (2008–2018), the “30 by 30” vision (2019–2025), and the current Singapore Food Story 2 (2025–present).

The current framework rests on four mutually reinforcing pillars: import source diversification, local production as a strategic buffer, multi-layered strategic reserves, and treaty-based global partnerships.

The replacement of the “30 by 30” vision with commodity-specific targets in 2025 illustrates a defining governance trait: measurable goals, honest mid-course assessment, and rapid correction when targets prove unattainable.

The newest pillar — legally binding supply agreements such as the Agreement on Trade in Essential Supplies with New Zealand — converts market-based trading relationships into institutionalised commitments, and may become a reference model for small open economies confronting trade fragmentation.



1. Introduction

Food security is conventionally framed as a production problem: nations secure their food by growing it themselves. Singapore is the most striking counterexample to that logic. It has a land area of about 728 square kilometres, of which less than 1% is agricultural land, and more than 90% of its food is imported. Nonetheless, the city-state has built a robustly secure food system. In the inaugural Resilient Food Systems Index published by Economist Impact in March 2026, Singapore ranked 9th among 60 countries — the highest score in Southeast Asia and the only ASEAN economy in the global top 25.¹ The academic literature on Singapore’s food policy has long treated it as a distinctive case: resilience built on imports rather than self-sufficiency built on production.^{2,3}

That outcome was not preordained. Throughout its development, Singapore has faced the trade-offs that confront every food-importing economy — between import dependence and local production, and between market efficiency and strategic security. Its policy history includes both successful institutional innovations and one publicly acknowledged failure of target-setting. This report reviews that history, dissects the current policy framework known as Singapore Food Story 2, and assesses its implications for supply chain governance in an era of trade disruption.

¹ Economist Impact. (2026, March 17). *Resilient Food Systems Index: Global Report*.

<https://insights.economistenterprise.com/energy-environment/resilient-food-systems-index>

² Tortajada, C., & Zhang, H. (2016). Food policy in Singapore. In *Reference module in food science*. Elsevier.

<https://doi.org/10.1016/B978-0-08-100596-5.21083-4>

³ Teng, P. (2020). Assuring food security in Singapore, a small island state facing COVID-19. *Food Security*, 12, 801–804. <https://doi.org/10.1007/s12571-020-01077-0>



2. From Agrarian Society to the Global Dining Table

Singapore's agriculture had a brief golden age. In the late 1950s, roughly 25% of the land area was farmed, supporting about 20,000 vegetable, fruit, livestock and fish farms. The Primary Production Department, established in 1959, coordinated agricultural and fisheries development.¹ From the late 1960s through the 1980s, local production achieved full self-sufficiency in eggs and pork, and about 80% in poultry^{2, 3} — a remarkable level of self-sufficiency for a city-state.

Industrialisation reversed this trajectory. In 1984, the government announced that it would no longer pursue food self-sufficiency; land was reallocated to manufacturing, finance and housing.^{4, 5} Farmland shrank from 14,000 hectares in the 1960s to 2,037

¹ Choo, R. (2022, October 12). *Of change & challenges: Reminders from Singapore's past agricultural transformations*. Singapore Food Agency. <https://www.sfa.gov.sg/food-for-thought/article/detail/of-change-challenges-reminders-from-singapore-s-past-agricultural-transformations>

² Choo, R. (2022, October 12). *Of change & challenges: Reminders from Singapore's past agricultural transformations*. Singapore Food Agency. <https://www.sfa.gov.sg/food-for-thought/article/detail/of-change-challenges-reminders-from-singapore-s-past-agricultural-transformations>

³ Food and Agriculture Organization of the United Nations. (n.d.). *Animal feed resources in Asia and the Pacific*. <https://www.fao.org/4/AC153E/AC153E13.htm>

⁴ Centre for Liveable Cities. (2018). *Food and the city: Overcoming challenges for food security*. CLC Knowledge Hub. <https://knowledgehub.clc.gov.sg/publications-library/food-and-the-city/>

⁵ Choo, R. (2022, September 2). *Rethinking self-sufficiency: Lessons from Singapore's pig farming past*. S. Rajaratnam School of International Studies. <https://rsis.edu.sg/rsis-publication/nssp/singapores-food-security-rethinking-self-sufficiency-lessons-from-singapores-pig-farming-past/>

hectares by 1988,^{1,2} and today occupies less than 1% of the land area.³

The steady contraction of farmland shifted Singapore's food supply from local production to global sourcing. By 2024, more than 90% of Singapore's food was imported, with import sources extending to over 180 countries and regions.⁴ As imports have kept growing, locally produced food has long accounted for only a small share of total consumption: in 2024, local self-sufficiency in eggs stood at 34.4%⁵ while self-sufficiency in vegetables and seafood was roughly 3% and 6% respectively.⁶ Overall, locally produced food meets less than 10% of national nutritional needs.

What Singapore imports is not merely food itself, but also the land and water required to produce it. This is what scholars call “virtual water” and “virtual land” — a concept first developed in academic work on water-scarce trading economies⁷ and more recently applied to agricultural trade in Southeast Asia.⁸ Singapore's import strategy in effect borrows the resource endowments of its supplier countries, freeing its own scarce land for higher-value uses. The corollary is direct exposure to external risk: climate stress in the Mekong Delta rice belt, or extreme weather striking Southeast Asian fisheries, transmits quite directly to Singapore's supply chains. The deeper the resource borrowing, the deeper the risk coupling — the structural condition that the entire policy architecture is designed to manage.

¹ Centre for Liveable Cities. (2018). *Food and the city: Overcoming challenges for food security*. CLC Knowledge Hub. <https://knowledgehub.clc.gov.sg/publications-library/food-and-the-city/>

² SG101. (2025, November 24). *AgriTech in Singapore: Achieving food and economic security*. Government of Singapore. <https://www.sg101.gov.sg/economy/case-studies/agritechinsg/>

³ Centre for Liveable Cities. (2018). *Food and the city: Overcoming challenges for food security*. CLC Knowledge Hub. <https://knowledgehub.clc.gov.sg/publications-library/food-and-the-city/>

⁴ Singapore Food Agency. (2025, June 5). *Singapore food statistics 2024*. <https://www.sfa.gov.sg/news-publications/newsroom/singapore-food-statistics-2024>

⁵ Ramanee, J. (2025, June 20). Singapore's egg sector thrives as local production rises. *aviNews*. <https://avinews.com/en/singapore-boosts-egg-self-sufficiency/>

⁶ Singapore Food Agency. (2025, June 5). *Singapore food statistics 2024*. <https://www.sfa.gov.sg/news-publications/newsroom/singapore-food-statistics-2024>

⁷ Allan, J. A. (2003). Virtual water — the water, food, and trade nexus. Useful concept or misleading metaphor? *Water International*, 28(1), 106–113. <https://doi.org/10.1080/02508060.2003.9724812>

⁸ Nguyen, T. T. H., Trinh, P. N., Pham, A. T., & Vu, T. N. T. (2025). Unveiling Vietnam's trade dynamics: The perspective of virtual water on agricultural products trade for sustainable water resource management. *Journal of Cleaner Production*, 503, 145430. <https://doi.org/10.1016/j.jclepro.2025.145430>



3. Five Strategic Transformations

The evolution of Singapore's food security goals has not been smooth. Each of the five phases was, at its core, a response to a specific external shock rather than an incremental adjustment of the previous phase.

Phase One (1965–1985): Agricultural survival. Facing water-supply concerns linked to Malaysia and the aftermath of Indonesia's Konfrontasi, the young republic treated local farming as close to a survival imperative. Even in this phase, an institution that endures to this day was created: in 1968, the government introduced the Rice Stockpile Scheme, requiring importers to hold buffer stocks in designated warehouses.^{1,2} The scheme has survived every subsequent policy shift; importers are currently required to hold stocks equal to twice their average monthly import volume.³

Phase Two (1985–2007): De-agriculturalisation. The 1984 decision to abandon self-sufficiency rewrote Singapore's strategy from local production to global sourcing, and import sources expanded steadily through this period. When Thai rice exports came under pressure during the 1997 Asian financial crisis, the episode provided early evidence of the value of a diversified supply base in insulating domestic prices from external shocks.

¹ Ministry of Trade and Industry Singapore. (2022, July 4). *Written reply to PQ on stockpiling of key food items*. <https://www.mti.gov.sg/Newsroom/Parliamentary-Replies/2022/07/Written-reply-to-PQ-on-stockpiling-of-key-food-items>

² *What happens if Singapore runs out of food? The national stockpiles, explained*. (2020, February 11). The Kopi. <https://thekopi.co/2020/02/11/national-stockpiles-explained/>

³ Ministry of Trade and Industry Singapore. (2022, July 4). *Written reply to PQ on stockpiling of key food items*. <https://www.mti.gov.sg/Newsroom/Parliamentary-Replies/2022/07/Written-reply-to-PQ-on-stockpiling-of-key-food-items>

Phase Three (2008–2018): Crisis-driven institutional rebuilding. The 2008 global food crisis — rice prices doubling and multiple countries imposing export bans — struck directly at the import-dependent model. Singapore established an inter-ministerial committee on food security in response. In 2013, the Agri-Food and Veterinary Authority issued a Food Security Roadmap setting commodity-level self-sufficiency targets: 10% for leafy vegetables (from a 2010 baseline of 7%), 30% for eggs (from 22%) and 15% for fish (from 4%).¹ The targets were deliberately confined to categories with comparative advantage, feasible technological pathways or highly concentrated import risk.

In 2014, the government further launched the Agriculture Productivity Fund, co-funding farms' adoption of advanced production systems and capacity upgrades;² by 2018, self-sufficiency had reached 13% for leafy vegetables, 24% for eggs, and doubled to 9% for fish.³ The capabilities built in this phase laid the institutional groundwork for the creation of the Singapore Food Agency (SFA) in April 2019 and the “30 by 30” vision that followed.

Phase Four (2019–2025): The “30 by 30” experiment. In 2019, the government set the goal of meeting 30% of the nation's nutritional needs from local production by 2030. Panic buying during the COVID-19 pandemic appeared to vindicate the ambition, and the episode has since become a widely studied test of the resilience of Singapore's import-dependent model.^{4, 5} But the target ultimately proved unattainable: local output remained below desired levels for six consecutive years.⁶ Critics identified the design flaws — a single aggregate nutritional indicator, no clear prioritisation and baselines left unpublished for years — which weakened both manageability and accountability.⁷

¹ Montesclaros, J. M. L. (2025, December 29). CO25250 | *Singapore food story 2: Setting hand to plough once again*. S. Rajaratnam School of International Studies. <https://rsis.edu.sg/rsis-publication/rsis/singapore-food-story-2-setting-hand-to-plough-once-again/>

² Lim, K. T. (2021, February 10). *Singapore: Food security despite the odds*. Singapore Food Agency. <https://www.sfa.gov.sg/food-for-thought/article/detail/singapore-food-security-despite-the-odds>

³ Montesclaros, J. M. L. (2025, December 29). CO25250 | *Singapore food story 2: Setting hand to plough once again*. S. Rajaratnam School of International Studies. <https://rsis.edu.sg/rsis-publication/rsis/singapore-food-story-2-setting-hand-to-plough-once-again/>

⁴ Teng, P. (2020). Assuring food security in Singapore, a small island state facing COVID-19. *Food Security*, 12, 801–804. <https://doi.org/10.1007/s12571-020-01077-0>

⁵ Tortajada, C., & Lim, N. S. W. (2021). Food security and COVID-19: Impacts and resilience in Singapore. *Frontiers in Sustainable Food Systems*, 5, 740780. <https://doi.org/10.3389/fsufs.2021.740780>

⁶ *Singapore drops 30-by-30 food goal amid high costs*. (2025, November 5). The Poultry Site. <https://www.thepoultrysite.com/news/2025/11/singapore-drops-30-by-30-food-goal-amid-high-costs>

⁷ Montesclaros, J. M. L. (2025, December 29). CO25250 | *Singapore food story 2: Setting hand to plough once again*. S. Rajaratnam School of International Studies. <https://rsis.edu.sg/rsis-publication/rsis/singapore-food-story-2-setting-hand-to-plough-once-again/>

Phase Five (2025–present): Pragmatic recalibration — from a broad vision of “nutritional self-sufficiency” to specific, measurable commodity targets. On 4 November 2025, Minister for Sustainability and the Environment Grace Fu announced Singapore Food Story 2, replacing “30 by 30” with two quantifiable commodity-class targets: by 2035, local production will supply 20% of fibre consumption (leafy and fruited vegetables, beansprouts and mushrooms) and 30% of protein consumption (eggs and seafood).¹ The stated rationale — that the targets take into account the current strengths of the local agri-food ecosystem and the potential for supply growth² — marks a shift in target-setting from aspiration to feasibility. Figures released in 2026 showed that as of 2025, local production accounted for 8% of local fibre consumption and 25% of local protein consumption.³

¹ Ministry of Sustainability and the Environment. (2025, November 4). *Asia-Pacific Agri-Food Innovation Summit (Singapore International Agri-Food Week) - Ms Grace Fu* [Speech]. <https://www.mse.gov.sg/latest-news/asia-pacific-agri-food-innovation-summit--singapore-international-agri-food-week---ms-grace-fu/>

² Ministry of Sustainability and the Environment. (2025, November 4). *Asia-Pacific Agri-Food Innovation Summit (Singapore International Agri-Food Week) - Ms Grace Fu* [Speech]. <https://www.mse.gov.sg/latest-news/asia-pacific-agri-food-innovation-summit--singapore-international-agri-food-week---ms-grace-fu/>

³ Singapore Food Agency. (2026, May 8). *Singapore food statistics 2025*. <https://www.sfa.gov.sg/news-publications/newsroom/singapore-food-statistics-2025>

The Singapore Food Agency is also studying a multi-tenant “stacked farm” model — shade-tolerant aquaculture and mushrooms on the lower tiers, controlled-environment leafy greens and light-demanding crops above — to offer farms plug-and-play space with lower start-up and operating costs.¹

Independent academic assessments likewise find that this vertically layered, resource-efficient model is a realistic route to raising local self-sufficiency under Singapore’s land constraints^{2,3}. However, broader vertical farming literature cautions that its social and economic benefits are often assumed rather than rigorously demonstrated.⁴ Moreover, even technically viable vertical farms can flounder once operating costs outrun revenue, as Singapore’s experience with early vertical farms attests.⁵

Pillar Three: Multi-layered strategic reserves. The reserve system combines national stockpiles with mandatory private stockholding. Under the Rice Stockpile Scheme, importers must hold stocks equal to twice their monthly import volume in government-designated warehouses⁶ — a statutory obligation that maintains a solid buffer at minimal fiscal cost. Regionally, participation in the ASEAN Plus Three Emergency Rice Reserve (APTERR) adds a layer of shared insurance and additional crisis-response channels; academic assessments credit the mechanism with strengthening members’ collective food security, even though its funding remains highly concentrated among a few contributing countries.⁷

Pillar Four: Treaty-based global partnerships. This newest pillar upgrades supply relationships from market transactions to binding institutional commitments. Singapore

¹ Tan, C. (2024, November 14). Singapore Food Agency unveils options to boost output under Lim Chu Kang masterplan. *The Straits Times*. <https://www.straitstimes.com/singapore/singapore-food-agency-unveils-options-to-boost-output-under-lim-chu-kang-master-plan>

² Wood, J., Wong, C., & Paturi, S. (2020). Vertical farming: An assessment of Singapore City. *eTropic: Electronic Journal of Studies in the Tropics*, 19(2), 228-248. <https://doi.org/10.25120/etropic.19.2.2020.3745>

³ Song, S., Hou, Y., Lim, R. B. H., Gaw, L. Y. F., Richards, D. R., & Tan, H. T. W. (2022). Comparison of vegetable production, resource-use efficiency and environmental performance of high-technology and conventional farming systems for urban agriculture in the tropical city of Singapore. *Science of the Total Environment*, 807, 150621. <https://doi.org/10.1016/j.scitotenv.2021.150621>

⁴ Kluczkowski, A., Hadley, P., Yap, C., Ehgartner, U., Doherty, B., & Denby, K. (2025). Urban vertical farming: Innovation for food security and social impact? *Philosophical Transactions of the Royal Society B*, 380(1935), 20240154. <https://doi.org/10.1098/rstb.2024.0154>

⁵ Bartlett, D., Carmel, E., Miller, E., & Wolf, H. (2026). Technology adoption in the vertical farming industry. *Frontiers in Sustainable Food Systems*, 10, 1848227. <https://doi.org/10.3389/fsufs.2026.1848227>

⁶ Ministry of Trade and Industry Singapore. (2022, July 4). *Written reply to PQ on stockpiling of key food items*. <https://www.mti.gov.sg/Newsroom/Parliamentary-Replies/2022/07/Written-reply-to-PQ-on-stockpiling-of-key-food-items>

⁷ Napitupulu, S., Irawan, L., & Vidi, M. (2021). ASEAN Plus Three Emergency Rice Reserve (APTERR): An analysis on its role to the ASEAN food security in the global pandemic. *Journal of ASEAN Dynamics and Beyond*, 2(1). <https://doi.org/10.20961/aseandynamics.v2i1.54627>

and New Zealand concluded substantive negotiations on the Agreement on Trade in Essential Supplies (AOTES) in October 2025 and formally signed the agreement on 4 May 2026¹ — the world’s first legally binding bilateral supply chain resilience agreement, under which both parties commit not to impose export restrictions on essential supplies during crises. In parallel, Singapore has signed rice trade memoranda of cooperation with Vietnam (30 October 2025),² Thailand (7 November 2025)³ and Cambodia (10 April 2026),⁴ establishing supply commitments and crisis-continuity arrangements with each of these major rice suppliers. The design principle is a legal moat: institutionalised guarantees to shore up the very link where goodwill has historically been most likely to fail — in a crisis.

¹ *Singapore-New Zealand ink world’s first essential supplies pact*. (2026, June 17). Asia Business Law Journal. <https://law.asia/essential-supply-agreement/>

² Ministry of Sustainability and the Environment. (2025, October 30). *Singapore and Viet Nam sign memorandum of cooperation on rice trade*. <https://www.mse.gov.sg/latest-news/singapore-and-viet-nam-sign-memorandum-of-cooperation-on-rice-trade/>

³ Thailand and Singapore sign rice trade agreement for 100,000 tonnes over 5 years. (2025, November 7). *The Nation*. <https://www.nationthailand.com/news/asean/40057892>

⁴ Ministry of Sustainability and the Environment. (2026, April 10). *Singapore and Cambodia sign memorandum of cooperation on food security*. <https://www.mse.gov.sg/latest-news/singapore-and-cambodia-sign-memorandum-of-cooperation-on-food-security/>



5. Assessment: Pragmatic Balance and Systemic Resilience

Food security has never been a binary choice between self-sufficiency and imports; it is an institutional system carefully engineered under tight resource constraints. Singapore's six decades show that a small state with less than 1% of its land in agriculture can, through flexible policy and long-range vision, secure for itself a margin of safety far beyond its geographic limits. In an era when tariffs cannot be dodged and risks cannot be precisely priced, that flexibility and foresight may reap benefits more than any single policy. Looking across 60 years of policy evolution, three features of the Singapore model merit emphasis.

First, measurable goals and honest correction. The contrast between the “30 by 30” vision and its successor is a governance lesson in itself. A broad, aspirational indicator proved hard to manage; commodity-specific targets restored trackability and accountability. A recent large-scale bibliometric analysis of food security research points the same way: research and policy effort translate into real outcomes only in the presence of specific indicators and strong institutional capacity.¹ Notably, the government publicly acknowledged the earlier target's infeasibility and revised it promptly, instead of postponing the adjustment to avoid reputational concerns.

Second, incentive design that respects market signals. In Singapore, local produce is generally more expensive than imports. Rather than mandating consumers to buy local

¹ Hernández-Paez, D. A., Vergara-Rios, J. C., Montoya-Quintero, K. F., & Lozada-Martinez, I. D. (2026). Does food security research really improve people's lives? A framework to estimate its potential impact from 2000 to 2025. *Global Food Security*, 49, 100925. <https://doi.org/10.1016/j.gfs.2026.100925>

or subsidising local production, Singapore implements its policies through consumer education campaigns and “support local” labelling. It also increases food supply through introducing new food categories such as plant-based and alternative proteins,^{1,2}. At the same time, it taps digital efficiency tools, such as AI, for demand forecasting and blockchain traceability. Academic analyses of Singapore’s food research and innovation strategy likewise find that regulatory agility and sustained R&D investment — rather than direct market intervention — are the hallmarks of its approach.^{3,4} Food security is achieved by working with market forces, not against them.

Third, multi-layered capacity. Singapore expands its capacity to handle food supply crises in multiple ways. The diversification of food sources helps to cope with food supply disruptions. Its food reserves buffer against short, sudden food shortages. Local production provides recovery capacity in crises, while treaties protect the import lifeline itself. The system is engineered for a multi-layered buffer rather than reliance on any single point of resilience.

The model’s limits are equally clear. Local production remains structurally uncompetitive on cost, and consumer price sensitivity caps its growth. Borrowing virtual resources means that external ecological and geopolitical risks transmit directly into Singapore’s food system. The treaty protection layer, while innovative, has yet to face the real test of a systemic global crisis in which multiple partners fall into food shortage simultaneously.

¹ Tan, C. Y. Y., Yan, Y., Choo, J., Cai, X., Yusri, H., Puniemoorthy, N., ... & Carrasco, L. R. (2025). Improving perceptions of cultivated meat and plant-based proteins in Singapore. *Scientific Reports*, 15, 31552. <https://doi.org/10.1038/s41598-025-17395-2>

² Hwang, Y.-H., Samad, A., Muazzam, A., Alam, A. M. M. N., Kim, S., Kim, C., & Joo, S.-T. (2026). Modern trends in alternative proteins and processing technologies for sustainable food systems with antioxidant implications. *Antioxidants*, 15(5), 535. <https://doi.org/10.3390/antiox15050535>

³ Li, A. Z., Yeo, Y. T., & Chen, W. N. (2025). Safeguarding sustenance: Singapore’s strategic commitment to enhancing food security through advancing food research and innovation. *Philosophical Transactions of the Royal Society B*, 380, 20240164. <https://doi.org/10.1098/rstb.2024.0164>

⁴ Ludher, E. K., & Teng, P. (2026). Agricultural development and food security in Singapore. In R. Rasiah, A. Venus, & N. A. Ishak (Eds.), *Sustainable agriculture and food security in Southeast Asia*. Springer. https://doi.org/10.1007/978-981-95-0477-0_2



6. Outlook

Singapore Food Story 2 sets the policy direction to 2035: local production to account for 20% of local fibre consumption and 30% of protein consumption, continued import diversification, and a steadily expanding network of essential-supplies agreements. Implementation challenges remain in the form of high energy costs in controlled-environment agriculture, consolidation in the farm sector, and the long-standing gap between security value and market price.

Yet the deeper significance of the Singapore case lies beyond these specific targets. Six decades of policy evolution show that food security has never been a binary choice between self-sufficiency and openness. Instead, it is an institutional design problem of allocating scarce resources across complementary layers of protection. A city-state with less than 1% of its land in agriculture has, through institutional innovation, technological investment and international agreements, pushed its food security frontier far beyond its geographic boundaries. In an age of proliferating tariff walls and weaponised trade, the lessons in enhancing food security carry well beyond the island.