What do we know about THE FUTURE OF FOOD SYSTEMS IN SOUTHEAST ASIA?

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Key messages

- The food systems of Southeast Asia (SEA) are projected to be under increasing pressure due to multiple drivers, including population growth, urbanization, biodiversity loss, and the uncertainties stemming from climate change.
- Rice and fish will remain staple foods and the backbone of diets in the region's rural and urban areas. In 2019, SEA produced 72 percent of the world's aquatic food products and 25 percent of the world's rice. Rice accounts for 50 percent of calorie intake for its population, while fish contributes more than 50 percent of per capita average animal protein intake. These shares are expected to rise over the next several decades due to population growth.
- Production and consumption of staple foods are expected to fall due to the impacts of climate change, potentially jeopardizing food and nutrition security in the region and beyond. The projected magnitude of climate change impacts on rice production varies greatly, depending on the models used.
- Previous regional foresight studies have explored the implications of climate change on food production in SEA, but other driving forces and outcomes of food systems transformation have received less attention.

RECENT TRENDS AND CHALLENGES

Rice and fish systems are key to food and nutrition security in Southeast Asia (SEA). These systems are subject to increasing pressure due to multiple drivers. Rapid urbanization with high population growth and economic development are projected to increase demand for nutrient-enriched cereals and animal-source foods (livestock and fish). Global climate change, land and environmental change, technological innovations, changes in dietary patterns, and accelerated urbanization will trigger food systems transformation in SEA. The region will remain important in global rice and aquatic food markets. As global annual per capita consumption of aquatic foods increased from 1961 to 2019, the SEA region's per capita consumption also grew, accounting for 72 percent of the total aquatic foods available for human consumption (FAO 2022). Within SEA, per capita consumption of rice decreased in Thailand from the late 1980s through 2020, while it increased in Bangladesh, the Philippines, and Viet Nam (Bin Rahman and Zhang 2023), and is projected to decrease further by 2030 (OECD-FAO 2021). Future growth in rice demand in the region will be mainly due to population growth (Pede et al. 2024).

Yield stagnation and limited land and farming expansion pose key challenges to the region's remaining a major global rice and fish supplier in the context of increasing global and regional demand in the future. One issue for major cereals in the region meeting the increased demand brought by urbanization and change in dietary patterns. Moreover, these crops are also drivers of greenhouse gas (GHG) emissions and natural resource degradation. Aquaculture growth in the region continues to increase to meet the demand for animal protein, but is accompanied by land competition with agriculture, feed competition with livestock, and the problem of using edible fish to feed farmed fish (Zurek, Hebinck, and Selomane 2020).

LATEST FORESIGHT RESEARCH

As food and nutrition security is a major problem in the region, several foresight studies draw pathways to increase the supply of affordable and healthy foods and to ensure consumers' access to them. Current trends suggest that while diets will improve in terms of calories and some micronutrients, the intake of foods that contribute to high-quality diets only in small quantities will tip over into excessive consumption (Haddad et al. 2016). Woodhill et al. (2022) project that by 2025 11 percent of the population will live in moderate poverty in East and Southeast Asia, with agriculture in the latter region employing 56 percent of the impoverished population.

Haddad et al. (2016) projected that SEA would be the third-fastest-growing region in Asia in terms of real per capita gross domestic product by 2030. Sales of ultra-processed foods in East and Southeast Asia are expected to approach those of high-income countries by 2035. A key difficulty for the Philippines will be to bring red meat consumption more in line with recommended levels by 2050. Nearly two-thirds of the South and Southeast Asian population will be overweight or obese by 2030. Findings from Yuan et al. (2022) showed the sizable exploitable yield gaps in the SEA region, particularly in Cambodia, Myanmar, the Philippines, and Thailand. Their study provides insights for increasing regional production on existing cropland by narrowing existing yield gaps. In the SEA region's deltas, sea level rise is becoming more pronounced and is likely to worsen over time, leading to saltwater intrusion and flooding (Schneider and Asch 2020). This will continue to be the major climate hazard affecting the land used for rice cultivation in the region.

Based on a reference scenario with international agricultural research and development continuing along current trajectories, Kruseman et al. (2020) projected that both production and consumption of the major staples in Asia – such as rice, maize, and wheat – will increase between 2010 and 2050. The major cereals retain a dominant role in both the supply and demand sides of the agrifood system. Therefore, investing in agricultural productivity in Asia is imperative to increase cereal production, with rural transformation important to tackling the increasing demand brought by urbanization and dietary change. In terms of projected calorie consumption growth in the region, the share of cereals in calorie intake will decline as diets become richer in animal products and high-value products between 2020 and 2050.

Regarding the linkage between food systems, the environment, and climate change, Zurek, Hebinck, and Selomane (2020) projected that agricultural GHG emissions (particularly from rice production, livestock

production, and fertilizer use) would increase by at least 28 percent between 2010 and 2050, suggesting that GHG emissions could be reduced through the development of improved technologies or strategies. Cenacchi et al. (2021) also projected that climate impacts will affect most of the cereal crops in SEA, decreasing income and total calorie availability and increasing the population at risk of hunger (relative to a no-climate-change scenario). They indicated that enhanced investments in public international agricultural research and development could offset the region's climate impacts on food security. Mason-D'Croz et al. (2016) analyzed agricultural investment, enforcement capacity and regional collaboration, land degradation, and market scenarios in Cambodia, Laos, and Viet Nam. The authors projected an increase in rice yield of 10-20 percent by 2030 using the International Model for the Policy Analysis of Agricultural Commodities and Trade (IMPACT) and GLOBIOM models. Using calorie availability as a metric, the authors showed modest future food security improvements.

In the ASEAN (Association of Southeast Asian Nations) region, fish production and consumption are projected to continue growing until 2050. A scenario that is favorable to aquaculture sector development will contribute to increasing fish supply and demand and fish exports and reducing consumer prices compared to business-as-usual (BAU) (Chan et al. 2017; Tran et al. 2017). However, alternative scenarios such as disease outbreaks in aquaculture and climate change result in declining fish supply, demand, exports, and nutrient supply from fish in Bangladesh (Tran et al. 2022b). Climate change represents a potentially significant threat to sustainable fishery production in Viet Nam (Tran et al. 2022a). Using the IRRI Global Rice Model (IRGM), Pede et al. (2024) projected that Asia will remain the world's major source of rice production until 2050, with SEA contributing 27 percent of the region's rice output. The increase in fertilizer prices due to the Russia-Ukraine war also posed a challenge to rice production, given the projected decrease of 0.4-1.4 metric tons per hectare in Asian rice yields due fertilizer price increases (Mishra et al. 2024). Balié and Valera (2020), also using the IGRM, simulated the potential impacts of the removal of quantitative restrictions on rice imports in 2019 and the imposition of a 35 percent import tariff in the Philippines. They projected that the reform would lead to a sharp increase in imports, while domestic production would decline. Perez and Pradesha (2019) conducted a similar simulation using IMPACT and estimated that removing quantitative restrictions would substantially lower farm and retail rice prices. Policymakers would need to consider using the revenue from the tariff to support rice growers either to increase their competitiveness and modernize their rice production or to shift to other crops.

KEY GAPS AND OPPORTUNITIES FOR FORESIGHT RESEARCH

Although a few studies have looked at the future of specific commodities under various scenarios in the SEA region, particularly rice and fish, we are not aware of analyses that examine the implications for other outcome areas, such as gender equity, employment, aquaculture investment cost, GHG emissions, nutrition and poverty, and environmental sustainability, associated with different future projected trends. Future research is needed to explore the impact of major drivers, such as policy change, food system regulations, urbanization, technology innovations, and dietary change issues on food systems activities and outcomes in the region. Change in dietary patterns toward more sustainable, healthy, and balanced diets could be a major driver of change toward more climate-friendly food systems, but more work is needed to understand how diets will evolve and how policies can encourage desired outcomes. Also needed is future foresight work to highlight interactions, trade-offs, and synergies among multiple development outcomes, such as economic development, green growth and GHG emissions reduction, poverty alleviation, and environmental protection. Resolving some of the uncertainties around food system transformation outcomes through future foresight work can help inform how and when to bundle various interventions. Foresight studies can highlight the need for more holistic national policies and investments in agrifood systems to mitigate the effects of climate change with the achievement of climate-smart food systems and the Sustainable Development Goals.

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Related chapters on the future of food system drivers and impacts, regional and national perspectives, food commodities, and foresight tools are available in our Table of Contents.

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