

## EAST AND SOUTHEAST ASIA

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Over the past half century, the food systems of East and Southeast Asia<sup>1</sup> (ESA) have been shaped by rapid economic growth and structural transformation, intensifying climate- and weather-induced extreme events, and the region's unique agricultural landscape and value chain dynamics. Rapid urbanization and the concurrent dietary change (that is, increased consumption of processed and animal-source foods, with robust demand for rice) has exacerbated challenges within the nexus of climate change, natural capital, and sustainable food systems. By aligning research outputs, financial programs, and regional cooperation initiatives with national policy frameworks in the region, organizations such as the Asian Development Bank (ADB), the Association of Southeast Asian Nations (ASEAN), the Food and Agriculture Organization of the United Nations (FAO), the International Fund for Agricultural Development (IFAD), IFPRI, and CGIAR have facilitated improvements in food security, nutrition, and livelihoods in ESA countries, though important challenges remain. Looking ahead, food systems transformation in this region will require a multisectoral approach that includes cross-cutting foresight and integrated approaches that combine disruptive technologies, participatory governance, and scalable solutions supported by sustainable financing mechanisms. Successful experiences in the region, such as poverty reduction and low-carbon agricultural practices, can provide models for policies and actions in other regions.

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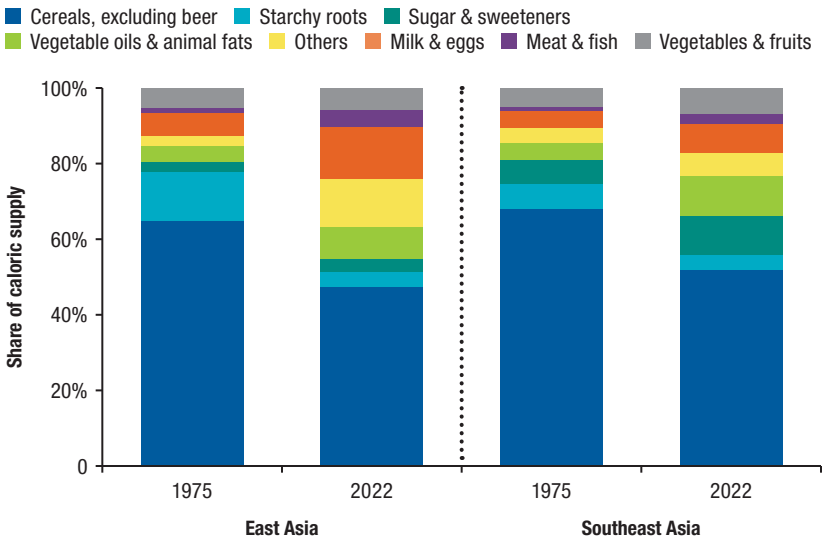
<sup>1</sup> East Asian countries are China, Japan, Democratic People's Republic of Korea, Republic of Korea, and Mongolia. Southeast Asian countries are Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Timor-Leste, and Viet Nam.

## Challenges over the past five decades

Since the 1960s, ESA has experienced unprecedented food systems transformation and improvements in nutrition, supported by rapid economic growth in East Asia. China's economic reforms and market opening since the late 1970s further boosted the region's economic growth and structural transformation; for example, the region's importance as a source of final demand and as a hub for regional production networks has grown substantially (UNESCAP 2019). Southeast Asia, where nutrition status was among the worst worldwide until the early 1990s, is now among the world's fastest-growing areas (although with varied levels of development across different countries) (Choiruzzad 2024). As a result, ASEAN member states reduced the region's extreme poverty from 47 percent in 1990 to 15 percent in 2015 (ASEAN 2025), China helped 800 million people move out of extreme poverty over the past 40 years (World Bank 2022), and the Global Hunger Index score for ESA improved from 28.5 in 1990 to 8.3 in 2024 (von Grebmer et al. 2015; WHH et al. 2024).

Nevertheless, food systems transformation and rural development in ESA have faced significant climate, demographic, and economic challenges. With the majority of the region's population and economic activities concentrated in coastal areas and river basins, regional food systems have been particularly vulnerable to droughts, floods, heat waves, typhoons, and rising sea levels (Chen and Zhan 2022). These intensifying climate impacts, coupled with global economic uncertainties over the past 50 years—including trade frictions, geopolitical conflicts, and pandemics—have degraded natural capital. This pressure has been compounded by the region's demographic change: in Southeast Asia, the population has nearly doubled since 1980, and in the developing ESA countries, the share of population aged 65 and above tripled to 12.1 percent, while the rural population fell by half since 1960 (World Bank 2025a). Together, these changes have driven competitive consumption of natural resources across sectors and geographic areas (Papilo et al. 2022), impeding the realization of greater inclusiveness, resilience, and sustainability (Lee et al. 2024; Zhou and Chen 2023).

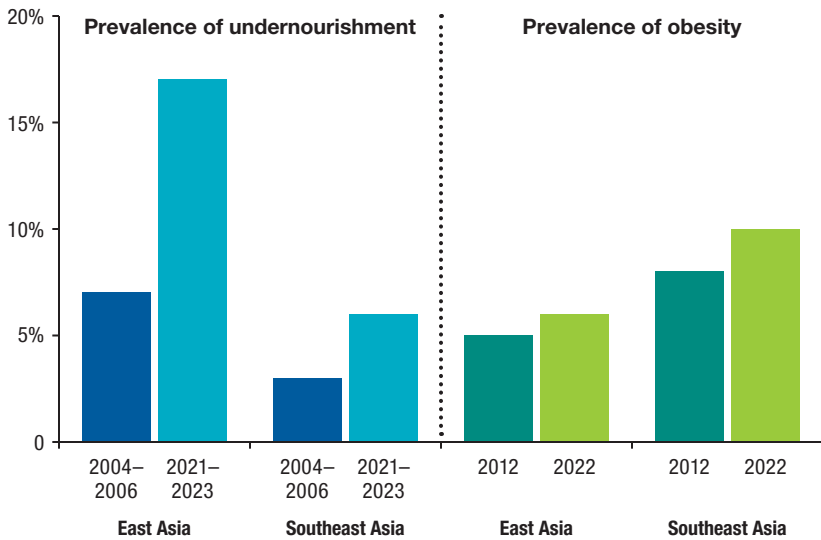
On the production side, ESA has long been crucial to global food security, contributing 20–30 percent of global cereal production and 50–80 percent of global aquaculture output since 1960. Recent data show the region produces more than half of the world's rice, 80 percent of aquatic foods, and significant quantities of sugar crops, meat products, and eggs (World Bank 2025a). Despite this large role, food production in the region relies heavily on small-scale household farming and on heavy use of synthetic nitrogen fertilizer to sustain yields amid climate shocks and constraints on other resources. Limited diversity of production and large postharvest losses have been difficult to

**FIGURE 22.1** Changing dietary composition in East and Southeast Asia, 1975 and 2022

Source: Data from FAO (2024).

address (Bennett et al. 2022; Sundram 2023). Efforts toward regional integration have been hindered by inconsistent adherence to standards for good agricultural practices, which constrains farmers' access to lucrative markets and limits broader food systems integration (GIZ 2024).

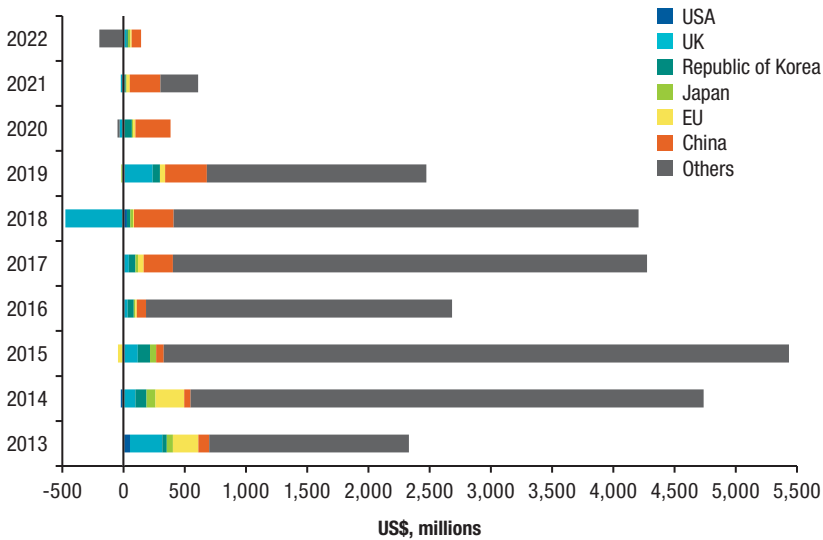
On the demand side, urbanization and income growth during the region's structural transformation have driven significant dietary changes, with a growing shift toward animal-source foods (Figure 22.1). Simultaneously, industrialization of domestic food sectors and powerful marketing by transnational food and beverage companies have fueled demand for ultra-processed foods and beverages (Baker and Friel 2016), often at the cost of human health and biodiversity along value chains (Kesse-Guyot et al. 2023; Leite et al. 2022). Despite significant strides in reducing poverty and hunger, residents in the region (especially low-income groups) have remained vulnerable, facing multiple burdens of malnutrition (Figure 22.2) and unable to afford healthy diets (FAO 2024). Furthermore, given the reliance of agriculture on weather conditions and chemical inputs, small-scale rural producers and vulnerable food consumers remain exposed to value chain vulnerabilities, including price inflation for fertilizers (nitrogen and phosphates) and food commodities, which heightens concerns about systemic crises in the region's food systems (Jones and Nti 2022).

**FIGURE 22.2** Undernourishment and obesity in East and Southeast Asia

**Source:** Data from FAO et al. (2024).

**Note:** The estimates for the years 2004–2006 and 2021–2023 are calculated based on three-year averages.

Financing and investment have been recognized as critical levers for addressing these long-term challenges and building the resilience of food systems, yet significant funding gaps persist. For instance, in China and Viet Nam, more than 60 percent of national agricultural budgets between 2010 and 2020 were allocated to infrastructure (especially for irrigation) and production subsidies (World Bank 2022). Because these subsidies are recognized as often encouraging unsustainable farming practices, redirecting these funds to capacity building and the application, dissemination, and scaling of agricultural technologies and innovations would likely better contribute to sustainable and resilient food systems. However, budget constraints—including declining foreign direct investment for agriculture (Figure 22.3) and rising government debt in many low- and middle-income countries in the region—as well as structural challenges, such as the urban bias of many policies and investments, have limited the scope of food systems financing (Chen et al. 2023) (see also Chapter 18). Given the limitations of public financing, engagement of the private sector and civil society in developing climate-resilient infrastructure and related initiatives has become increasingly critical (Chiengkul 2025) (see Chapters 4 and 5).

**FIGURE 22.3** Agriculture, forestry, and fishing FDI flows to ASEAN, 2013–2022

**Source:** Data from ASEAN (2023).

**Note:** FDI = foreign direct investment. Negative FDI usually indicates reverse investment or disinvestment.

## Evolution of research and policy responses

As empirical evidence and foresight projections regarding ESA have accumulated over the past five decades, integrated rural development<sup>2</sup> and sustainable food systems transformation have emerged as two key approaches to addressing these daunting challenges (see Chapter 3).

### Development and research organizations

Over this period, IFPRI and other research and development organizations made an important shift from supporting one-way knowledge transfer to approaches that combine participatory methods and technological innovation to facilitate food systems synergies (Habermann et al. 2023). These efforts address risks and resilience-building strategies for food systems transformation and urban and rural development, including increased emphasis on identifying and adapting to local contextual factors that shape outcomes. The ADB has

<sup>2</sup> Integrated rural development is a comprehensive strategy that enhances rural livelihoods by combining agricultural productivity, infrastructure development, education, healthcare, economic diversification, and other interconnected factors (see Chapter 3).

recognized that a holistic vision is necessary to navigate the nexus of climate change, natural capital, and sustainable food systems (ADB 2021), and as a multilateral development finance institution, the ADB plays a crucial role in funding food systems transformation and the low-carbon development initiatives of Asia's low- and middle-income countries. The World Bank also helps fund food systems transformation through the Food Systems 2030 Umbrella Multi-Donor Trust Fund (FS2030), established in 2020. This initiative complements other global efforts through financial and technical support for sustainable agriculture reforms across 30 countries. In collaboration with the FAO, the initiative developed a toolkit for repurposing agricultural policies, while IFAD contributed by tracking financial flows through its Financial Flows into Food Systems Model (3FS). Repurposing projects financed by FS2030 are now being implemented in Indonesia, driving policy reforms for more resilient and sustainable food systems. At the same time, countries including Cambodia, Lao PDR, and Viet Nam have joined the One Health Global Community of Practice, which is promoting healthy and sustainable diets (World Bank 2025b).

### **Policy evolution**

In parallel with the evolution of research on food systems, policies have evolved from a traditionally narrow focus on increasing agricultural production to a systems focus on multiple, integrated objectives: from reducing hunger (“eating enough”) to enhancing dietary quality (“eating well”) to advancing nutrition and health (“eating nutritious and healthy diets”) and ultimately to incorporating ecological sustainability (“eating green”). Among Asian countries, China exemplifies this shift through its transformation from traditional farmland-based agricultural policies to a broader strategy that leverages diverse land resources while balancing food security, nutritional needs, and ecological modernization.

Beginning in the late 1960s, the Green Revolution in ESA significantly enhanced wheat and rice productivity through the introduction of high-yielding crop varieties, intensive fertilizer and pesticide use, improved irrigation, and other technological advances (Swastika et al. 2024). The significant increase in agricultural productivity raised farmers' incomes and reduced famine across the region (Pingali 2012; Pingali and Abraham 2022). From its establishment in 1975, IFPRI aligned with these efforts, focusing on improving agricultural productivity among smallholder farmers by creating more supportive enabling environments. These included policies promoting land and water rights, pro-poor technologies, and access to appropriate input and output support, which further amplified the gains from Green Revolution technologies across Asia (IFPRI 2015a).

Economic reforms in the 1980s spurred further growth in the agriculture sector. In China, the Household Responsibility System incentivized productivity and sparked remarkable growth in the agriculture sector. In Viet Nam, the transition away from collective farming enabled rapid productivity gains, diversification of agricultural production, and growth in agricultural exports (Lin 1987; Pingali and Abraham 2022; Pingali and Xuan 1992). During this period, IFPRI facilitated Viet Nam's agricultural transformation through its Rice Market Monitoring and Policy Options Study, launched in 1995 with ADB support (IFPRI 2015b). IFPRI research influenced key decisions to relax rice export quotas, remove internal trade restrictions, and involve the private sector in exporting. Research from other institutes, including the Harvard Institute for International Development and the Centre for International Economics in Australia, likewise contributed to Viet Nam's transition from a command economy to a market economy. These reforms ultimately strengthened Viet Nam's agriculture sector, benefiting farmers and supporting the country's broader economic growth (Ryan 1999). As hunger became a less pressing concern for many ESA nations in this century, food policies shifted toward enhancing quality. For example, Thailand's From Farm to Table initiative in 2004 established a comprehensive food safety monitoring and control system, and China's revised Food Safety Law in 2015 reinforced its focus on food quality.

### **Addressing poverty and livelihoods**

In recent decades, low- and middle-income countries in the region have gradually incorporated human capital development into poverty reduction policies that work through food systems transformation and integrated rural development initiatives. For example, China introduced the Targeted Poverty Alleviation policy, which contributed to meeting the goal of eradicating absolute poverty by 2020 and shrank the country's urban–rural income gap. In addition to its focus on increasing incomes, China's strategy has paid particular attention to improving the health and nutritional status of impoverished rural groups (NCR 2021). Viet Nam transitioned to commercial agriculture between 1986 and 2000, and then began pursuing sustainability and resilience through its National Targeted Program on New Rural Development. This program has improved rural infrastructure, increased household incomes, and reduced regional socioeconomic disparities. Similarly, the Philippines' Pantawid Pamilyang Pilipino Program has tackled poverty through conditional cash transfers, aiming to reduce inequality by prioritizing children's health and education.

### **Climate change and sustainability**

As intensified climate- and weather-induced extreme events become common, ESA governments have generally supported policy efforts to adapt to and mitigate adverse climate impacts on food security, agricultural livelihoods, and other food-system-related components of well-being. In the past decade, many have submitted pledges under the United Nations Framework Convention on Climate Change and announced low-carbon development strategies, guidelines, and action plans that include the agriculture sector (Zhou et al. 2023). For instance, Cambodia, Lao PDR, Mongolia, Myanmar, the Philippines, and Viet Nam have set agriculture-specific greenhouse gas emissions targets. Viet Nam's National Climate Change Adaptation Plan identifies sustainable rice production and reduced agrochemical use as key goals to achieve by 2030. China achieved its goal of zero growth in the use of chemical fertilizers and pesticides by 2020 and has been examining the potential for reducing emissions through rural revitalization to meet its pledge to reach peak carbon emissions by 2030 and achieve carbon neutrality by 2060. CGIAR's MITIGATE+ Research Initiative (2022–2024) explored innovative low-carbon development potential rooted in local conditions and has identified China and Viet Nam as pilot nations for this work. This global initiative aims to ensure that a low-emissions food systems approach will continue to be part of the global political agenda based on rigorous science, good governance, and the principles of gender and social equity.

### **Regional integration**

Regional economic integration has been another cornerstone of food and agricultural policies. ASEAN's agricultural cooperation, which began in 1968, has expanded beyond production and supply concerns to encompass food security, safety, halal food standards, crop and livestock development, agricultural training, cooperatives, and joint initiatives for agricultural and forest products. Frameworks including the Integrated Food Security Framework and the Vision and Strategic Plan for ASEAN Cooperation in Food, Agriculture, and Forestry (2016–2025) articulate a vision for a competitive, inclusive, and sustainable regional food system.

The establishment of the ASEAN Free Trade Area in 1993 and the inclusion of agricultural products in 1995 marked significant milestones. ASEAN's deeper cooperation through free trade agreements and the Regional Comprehensive Economic Partnership (RCEP) has enhanced regional agricultural trade and market integration. Initiatives including the ASEAN Plus Three Cooperation Strategy and the Lancang–Mekong Cooperation

mechanism have further strengthened collaboration. The RCEP is projected to lower agricultural tariffs among member states, with China's tariffs on RCEP agricultural imports expected to drop from 14 percent to below 4 percent. This reduction, coupled with nontariff concessions, enhances trade prospects and promotes agricultural investment (see Chapter 16). RCEP also facilitates cross-border e-commerce and technical cooperation in areas such as pest control and animal health, helping to create pathways for sustainable agricultural growth (ASEAN-China Center 2023).

IFPRI's work helps to facilitate integration across ESA. For instance, the Agricultural Transformation and Market Integration in the ASEAN Region project (2016–2022)<sup>3</sup> informed improvements in policies, food safety, and investment in agrifood industries, reinforcing market integration and regional investments. Building on this, IFPRI has been a part of the ASEAN-CGIAR Innovate for Food Regional Program (2023–2027),<sup>4</sup> with a focus on strengthening agrifood trade and value chains across the ASEAN member states to ensure the region remains competitive and resilient within the global agrifood system.

## Toward 2050

ESA's food systems are at a critical juncture in the face of climate- and weather-related risks, demographic shifts, and structural transformation, but there are also promising opportunities. In Southeast Asia, rapid population growth is expected to increase the subregion's rice demand by 18 percent by 2040 (Yuan et al. 2022) and overall food demand by 40 percent by 2050 (Goyal et al. 2023). In the context of increasing demand, constraints on cropland expansion, and current yield trends, Cambodia, Myanmar, the Philippines, and Thailand are likely to see considerable gaps between average farmer rice yields and yield potential, and Indonesia and the Philippines are likely to increase their dependence on rice imports by 2040 to meet demand (Yuan et al. 2022). Given that vulnerable smallholders dominate agricultural production and vast low-income populations are put at risk by high food prices, the disproportionate impacts of climate change could increase the average poverty headcount in the region's rural areas. Concurrently, the nexus of climate

3 [www.ifpri.org/project/agricultural-transformation-and-market-integration-asean-region-responding-food-security-and/](http://www.ifpri.org/project/agricultural-transformation-and-market-integration-asean-region-responding-food-security-and/)

4 [www.cgiar.org/news-events/news/asean-and-cgiar-launch-joint-program-on-accelerating-innovation-in-agri-food-systems/](http://www.cgiar.org/news-events/news/asean-and-cgiar-launch-joint-program-on-accelerating-innovation-in-agri-food-systems/)

change, natural capital, and sustainable food systems in the region could be affected by the aging of the region's population, with the share of people over 59 expected to rise from 9.8 percent in 2017 to 20.3 percent by 2050 (WHO 2025).

The region's changing diets and lifestyles will have diverse impacts, including potentially increasing the coexistence of undernutrition in rural areas with rising obesity and diet-related noncommunicable diseases in urban centers, both of which need to be addressed (see Chapter 12) (Pingali and Abraham 2022). For example, childhood overweight and obesity have become major public health concerns in China, affecting 6.8 percent (overweight) and 3.6 percent (obese) of children under 6 as well as 11.1 percent (overweight) and 7.9 percent (obese) of those aged 6–17 between 2015 and 2019, with these rates expected to rise in the coming years (Pan et al. 2021; Pan and Fang 2024). Recent national initiatives in China, including Healthy China 2030 and the implementation plan for the Year of Weight Management Campaign (2024–2026), explicitly target obesity control, diet improvement, and increased physical activity.

Food systems in the region will also be reshaped by emerging opportunities, such as technological innovations that offer new pathways for food systems efficiency, risk mitigation, and market integration (Mojica-Sevilla 2023; Sarmiento 2023). Examples include use of rural big data platforms and machinery automation for smart agriculture systems, and modern biotechnology to respond to diseases and climate change. At the same time, the demand for healthier and lower-emissions foods from the region's expanding urban middle-income populations will also create new opportunities within food systems (Yang et al. 2018). Projections for China suggest that a combination of improving agricultural technologies, reducing food loss and waste, and shifting dietary patterns could reduce greenhouse gas emissions from the country's food system by 47 percent by 2060 compared with 2020 (IFPRI et al. 2021), helping to reconcile food systems development efforts with sustainability. Future analysis must delve into understanding trade-offs and potential synergies between integrated rural development and food systems transformation, such as balancing the combination of improving agricultural efficiency and adopting sustainable diets or balancing goals of emissions reduction from agriculture, rural revitalization, and ecosystem conservation. For example, small-scale paddy rice farming is a significant contributor to greenhouse gas emissions from food systems in the ESA region. Traditional rice cultivation practices, namely continuous flooding irrigation, create anaerobic conditions conducive to growth of microbes that produce methane emissions. In contrast,

circular agriculture that integrates rice cultivation with aquaculture, such as rice-fish systems, offers an opportunity for synergistic benefits (Kimura et al. 2022).

Aquaculture and palm oil production likewise present trade-offs. These sectors have played transformative roles in ESA's food systems as drivers of rural development, employment, and trade but have also raised environmental concerns and tensions. Several developing ESA countries have led the rapid expansion of farmed fish and aquatic products, with aquaculture production projected to grow by 21.1 percent in China, 26.2 percent in Indonesia, 22.3 percent in the Philippines, 15.6 percent in Thailand, and 13.1 percent in Viet Nam between 2020 and 2030 (FAO 2022). However, sustainability concerns (such as poor governance causing environmental degradation, habitat destruction, and overfishing) necessitate research into feed alternatives, improved disease management, and enhanced market access to reduce pressure on the region's environmental resources (FAO 2022). Similarly, palm oil production, which is dominated by Indonesia and Malaysia, has fueled rural development and growth in the global edible oil supply but has been linked to deforestation, biodiversity loss, and social conflicts (Pacheco et al. 2018).

Addressing these challenges through the emerging opportunities will require substantial policy innovations and regional cooperation, as well as responsive investments and financing. The ADB and other key development institutions in the region have shifted their strategic priorities toward integrated rural development. The ADB's investment in agriculture, natural capital, and rural development quadrupled between 2009 and 2020, reaching approximately US\$6 billion (ADB 2021), and for food systems transformation in the Asia and Pacific region, it has now committed \$40 billion by 2030. Initially dominated by irrigation investments, this portfolio now encompasses broader food systems priorities for the future, including (1) rural market infrastructure; (2) agro-industry, marketing, and trade; and (3) agricultural policy, institutional, and capacity development. To scale up these efforts, regional financial institutions, national governments, and private investors engage through substantial collaborative platforms, including South–South and trilateral cooperation, regional economic cooperation frameworks, and local partnerships. Capacity building throughout government, agricultural extension systems, and financial systems will be essential to streamline future food systems financing and funding.

While development organizations have provided valuable insights and funding in the region, policy implementation remains siloed and without coordinated structures or networks in many cases. Examples include

interjurisdictional watershed conservation and food standards for trade integration that consider nutrition and health. Stronger transnational cooperation facilitated by international and regional organizations, along with collaboration among governments, private sector entities, and civil society, is essential for integrating action frameworks and identifying scalable solutions for greater synergies. Strengthening regional collaboration through organizations such as ASEAN is another area for future policy and research, as a means to facilitate integrated action frameworks and scaled-up solutions to shared challenges. Promising areas for collaboration include developing nutrition- and health-oriented food standards and controlling agricultural pests and diseases.

Future policies of ESA nations and policy research by IFPRI and other development organizations for the region's food systems transformation and integrated rural development must embrace two key perspectives. First, although widely recognized in research and increasingly considered in policies, the concept of agrifood systems remains fairly narrow and is skewed toward food security in the ESA political landscape. A systems perspective is necessary to capture interactions among food and nutrition security, health, and environmental sustainability within the context of economic, demographic, and dietary changes in the region. Second, a participatory approach that supports the agency of marginalized smallholders and local consumers can help policymakers design interventions responsive to local dietary cultures, production conditions, and diverse sectoral interests, ensuring greater equity for all (Nguyen et al. 2024). Together, these systematic, regional, and locally informed perspectives can help to navigate food-systems-related policy and research to support regional integration and local opportunities in ESA, aimed toward reaching the Sustainable Development Goals by 2050.

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