Chapter 3

# A HISTORICAL AND REGIONAL PERSPECTIVE ON MYANMAR'S AGRIFOOD SYSTEM

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Agriculture and the related input supply, processing, trade, and retail distribution activities that make up national food systems are a major driver of rural economic transformation in low- and middle-income countries (Mellor 2017). As Chapter 2 shows, in addition to directly contributing to rural employment and GDP in Myanmar, the growth of the agrifood system has high multiplier effects on the broader rural economy. Yet in Myanmar, as Warr (2016) argues, lack of agricultural productivity growth combined with dependence on extractive sectors, such as jade, teak, and natural gas, has held back the transformation of the economy.

After almost five decades of narrowly prioritizing rice production and foreign exchange earnings, the Myanmar government began to shift its policy focus to promoting farmer welfare and rural development in 2011. A decade later, in early 2020, the COVID-19 pandemic not only demonstrated the resilience and adaptability of Myanmar's agrifood system but also highlighted its structural vulnerabilities. The military coup in February 2021 greatly exacerbated the stress on the agrifood system and weakened the state's capacity to contain the third (and deadliest) wave of COVID-19, resulting in a major humanitarian crisis.

An understanding of the strengths and weaknesses of Myanmar's agrifood system and rural economic transformation over the past decade—and particularly during the COVID-19 pandemic and since the military coup—is important to ensure the resilience of recovery and development efforts in Myanmar, as well as in transforming countries in Asia and other regions. To capture these lessons, this chapter addresses the following questions:

- How has Myanmar's agrifood system transformed over past decades, and to what extent have COVID-19 and the military coup disrupted this transformation?
- How does the performance of Myanmar's agrifood system compare with that of other countries in the region?

- What are the drivers of, and constraints to, agrifood system transformation in Myanmar?

## Myanmar's agrifood system: A historical perspective

### Agrifood system changes from the colonial era until 2020

Historically, agriculture has formed the backbone of Myanmar's economy, employing the majority of its workforce and accounting for more than half of export earnings and GDP. Beginning in 2011, a series of major policy reforms sought to promote industrial growth based on foreign direct investment and relaxation of the prior tight controls on foreign trade and investment. Even so, only by 2019 did the share of primary agriculture in total GDP fall to that of manufacturing (World Bank 2024), while the share of the agrifood system as a whole was close to half (46.7 percent—see Chapter 2). Today, however, Myanmar's agriculture sector still reflects the imprint, and some would argue the scars, of policies dating back to the colonial era.

During the colonial period, the Burma Land and Revenue Act of 1876 introduced formal land titling, offering rights of permanent tenure, inheritance, and transfer and permitting the use of land as collateral to access credit. The resulting land registration system became operational in British-controlled Burma, principally the lowland areas dominated by Bamar populations. In contrast, land in the ethnic hill regions, which account for about one-third of Myanmar's total area, was governed primarily by customary and communal land tenure systems (Chapter 6). Paddy production for export became the primary goal of colonial agricultural policy, and by the 1920s, Myanmar was well established as the world's largest rice exporter. The global depression of the 1930s led to a collapse in rice prices, widespread loan defaults, land seizures by moneylenders, and rising landlessness. There was a large-scale emergence of absentee landlords in the aftermath of the Japanese invasion during World War II (Brown 2012). Following the war, the failure to adopt a federalist constitution triggered more than 60 years of armed resistance by ethnic minorities, which lasted until a ceasefire agreement in 2012. In the face of this long-running conflict, land administration in the ethnic highlands remains primarily under customary tenure systems today (Lau 2014).

Following independence in early 1948, the newly constituted Burmese government quickly modified the colonial land policies. The Land

Nationalization Act of 1948, as amended in 1953, declared all land to be property of the state. The government, in turn, leased land to farmers for specific agricultural uses under nontransferable land use agreements. Specifically, suitable lowlands designated as paddyland could be used only for this purpose. Failure to grow paddy rice or to meet state-mandated production quotas resulted in the revocation of land use rights.

Throughout the military socialist era, from 1962 to 1988, Myanmar's agricultural policy facilitated a state-controlled agricultural system. This system was built around government land ownership and farmer lease agreements tied to government-designated production quotas. Three primary policy tools governed agricultural production: (1) state landownership, (2) production quotas for specific crops, and (3) compulsory sales to government agents at fixed prices (Okamoto 2020). Under nationalized land ownership, government agricultural officers treated farmers as tenants of the state, with tillage rights but no ownership or long-term guarantee of control and, consequently, little incentive to invest in land leveling or other improvements. Compulsory cropping plans, production quotas, and mandatory sales to government marketing agencies, often at below-market prices, eroded farmer incentives and led to long-term stagnation of agricultural productivity and competitiveness. By 1970, Thailand had surpassed Myanmar's rice exports, and by 1980, Viet Nam had as well. Low productivity led to supply shortages and intermittent rice price spikes, provoking political protests in 1967, 1974, and 1988 (Okamoto 2017). As a result, agricultural policy aimed to control key staple food supplies and stabilize food prices at low levels to quell urban dissent.

Following the protests of 1988, the change to a nonsocialist military government precipitated a gradual loosening of agricultural production and marketing controls. Liberalizing pulse production and marketing rapidly and radically improved profitability in this subsector. The government dropped production quotas on pulses, liberalized domestic marketing, and opened export marketing to private traders (Okamoto 2008). While production quotas on paddy continued until 2003, the government gradually relaxed its monopoly on rice exports, fully opening exports to the private sector in 2012.

The 2010s saw two successive governments attempt to invigorate agricultural growth and transform rural economies. From 2011 to 2015, the government of President Thein Sein sought to modernize rice production through mechanization and the promotion of hybrid rice by the Ministry of Agriculture and Irrigation (MOAI). A new Ministry of Livestock, Fisheries, and Rural Development (MLFRD) was established to encourage farm income growth through diversification and investment in rural infrastructure. A new

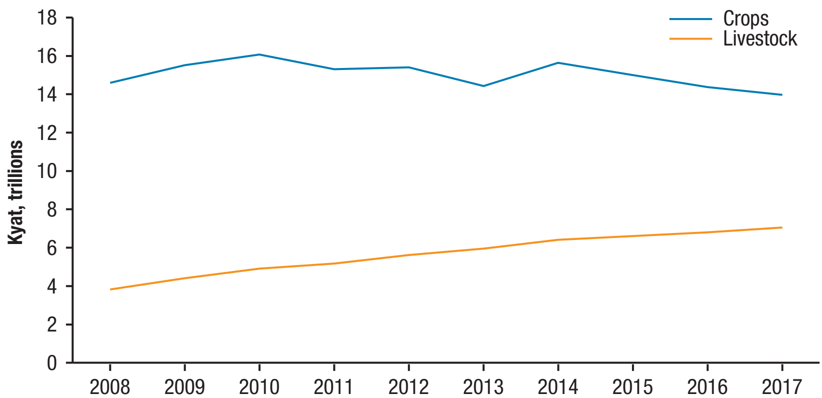
Farmland Law allowed farmers to buy, sell, and mortgage land while maintaining zoning restrictions on its use. Only rice could be cultivated on land designated as paddy land, for example.

From 2016 to 2020, the National League for Democracy–led government sought to further these reforms, emphasizing higher incomes for smallholders and improved competitiveness of value chains. MOAI and MLFRD merged with the Ministry of Cooperatives to form the Ministry of Agriculture, Livestock, and Irrigation (MOALI). A new agricultural strategy was formulated to support these objectives, emphasizing diversification, productivity growth, and value chain efficiency (MOALI 2018). The rural economy also benefited from the opening up of the telecommunications sector to foreign investment, with rural mobile phone access increasing from approximately 21 percent in 2014 to 82 percent of rural households by 2019. Almost 50 percent of rural households also had internet access by the same year (MoLIP 2015; 2020).

Despite apparently strong domestic political support for agriculture, overall sector growth was slow, and the major drivers of change between 2011 and 2020 had little to do with public initiatives. Primary agriculture GDP grew at just 0.5 percent per year in 2013–2017, down from 2 percent per year in the previous five-year period. These disappointing overall growth figures mask important differences among subsectors. Livestock and fisheries grew robustly, at 5.3 percent per year, propelled by expansion in poultry and egg production and aquaculture (Figure 3.1). In contrast, crop production fell, reflecting stagnant yields and declining cultivated area for some labor-intensive industrial crops (for example, cotton).

In recent years, growth in the value of fish production has varied by type of production. Aquaculture grew rapidly, while wild capture fishing decreased significantly because of overexploitation. Overall, in the three years from 2015/16 to 2017/18, the value of fish production slowed to just 1.6 percent per year. In contrast, value added in crop farming fell by 1.4 percent per year over the five years from 2013 to 2017, down from essentially flat annual growth (0.2 percent) in the previous five-year period (Figure 3.1). While weather- and trade-related price shocks can affect year-on-year changes, the growth trend in the crop subsector reflects a long-term decline in area cultivated (1.3 percent per year on average between 2008 and 2019), combined with limited improvement in yields for most crops (Table 3.1). Yields of monsoon paddy, which accounts for three-quarters of Myanmar's cereal area, decreased by 0.1 percent per year over this period, while post-monsoon irrigated paddy, which accounts for half the remaining cereal area, increased by only 0.4 percent per year. The

**FIGURE 3.1** Trends in agriculture sector GDP, 2008–2017




**Source:** Mather et al. (2020).

**TABLE 3.1** Average yield and trends for cereals, oilseeds, and pulses, by five-year period, 2008–2019

| | Average yield (kg/acre) | | | % change in yield | | |
|---|---|---|---|---|---|---|
| Crop | 2008–2019 | 2008–2013 | 2014–2019 | 2008–2019 | 2008–2013 | 2014–2019 |
| Dry paddy | 1,915 | 1,883 | 1,933 | +0.4 | +0.2 | +0.7 |
| Wet paddy | 1,548 | 1,560 | 1,534 | –0.1 | –0.4 | +0.2 |
| Maize | 1,450 | 1,382 | 1,497 | +1.2 | +1.0 | +1.4 |
| Wheat | 744 | 722 | 758 | +1.6 | +2.5 | +0.7 |
| Groundnut | 1,386 | 1,407 | 1,373 | +0.0 | +1.2 | –0.7 |
| Sesame | 226 | 234 | 221 | –0.5 | +1.4 | –2.0 |

**Source:** Mather et al. (2020).

only exceptions to stagnant yield growth were maize, for which expanded use of hybrid seed was linked to annual average yield growth of 1.2 percent over the same period, and some of the pulses (for example, black gram), for which new, disease-resistant varieties had been introduced.

Stagnant yield growth is surprising given that yields in Myanmar are already significantly below potential and those of many neighboring countries. While crop yields in Myanmar have stagnated, unfortunately increased labor wage rates and greater use of inputs, including fertilizer and pesticides, have further reduced profitability for farmers (Belton et al. 2020). Rural household livelihood surveys undertaken in each of the four main agroecological zones of Myanmar between 2015 and 2019 found accelerating migration out of rural areas (Chapter 15), rising daily labor wages (Chapter 18), and an agricultural mechanization revolution fomented largely by the private sector (Chapter 7). Farmers have strong incentives to adopt mechanized land preparation and harvesting, given the increasing scarcity and higher cost of hired labor, along with the machines improving the timeliness of crop operations and farmers' ability to manage weather risks. On the supply side, the expansion of financing from commercial banks, encouraged by partial loan guarantees from the donor sector, led to a rapid expansion in mechanization service providers (Chapter 7).

At the policy level, MOALI pursued the objectives of inclusive and competitive agriculture and food and nutrition security through the Agriculture Development Strategy (ADS) and its accompanying investment plan. After extensive regional consultations, ADS was officially launched on June 7, 2018. In parallel with these consultations, MOALI underwent a major internal reorganization, merging into one the three former ministries of Agriculture and Irrigation (MOAI); Livestock, Fisheries, and Rural Development (MLFRD); and Cooperatives. During the first year of ADS implementation, MOALI also faced the challenge of integrating its commitments with the government's Multi-Sectoral Nutrition Plan of Action, which was developed through a separate process under the leadership of the Ministry of Health and Sports (MoHS 2018). The combination of internal reorganization and complex cross-department and cross-ministry strategic planning absorbed almost half the timeline of the ADS's five-year mandate.

Once approved, ADS implementation proceeded quickly. In 2018/19, the first year of implementation, MOALI spent 92 percent of its budget of just over K1 trillion ($710 million) (MOALI 2022). In terms of budget allocations across departments, MOALI made progress on implementing recommendations from the first agricultural public expenditure review (World Bank 2017a). Reducing the expenditure shares of irrigation and mechanization enabled underfunded public services to expand their activities. The main constraints to ADS implementation were technical and organizational capacity—internally, across Union ministries, and in linkages to regional governments and stakeholders (MOALI 2020). As MOALI continued to move from the former MOAI's top-down focus on rice production to facilitating and regulating a modern, market-oriented agrifood system, it lacked a unified policy process supported by strong technical analysis capacity.

## Myanmar's agrifood system during the crisis years between 2020 and 2022

Myanmar experienced several waves of COVID-19, and strict lockdowns were ordered to reduce the spread of the disease (Chapter 1). The first wave occurred just as farmers, input suppliers, and mechanization service providers began preparing for the main 2020 agricultural season, the monsoon season. The second and third waves occurred at the midpoints of the 2020 and 2021 monsoon seasons. Even though the timing of the second and third waves in the agricultural calendar was similar, the challenges facing the agrifood system were very different.

Beginning in March 2020, transportation restrictions to curb the spread of COVID-19 caused significant disruptions throughout Myanmar's food supply chain. Restrictions during the first wave, which were often implemented at the local level without coordination, hindered deliveries of agricultural inputs ahead of the monsoon planting period. Input retailers reported longer lags on fertilizer orders, and mechanization service providers reduced their service areas (Boughton et al. 2021). Both sectors recovered quickly through a combination of business adaptation and less rigorous enforcement of travel restrictions. Monsoon crop production declined in some areas, partly because of pests and irregular rainfall, but overall, the production of important crops did not decline severely. National production estimates for rice and pulses declined by less than 4 percent in 2020 compared with 2019, while maize production increased by 2 percent over the same period (USDA 2021).

Although COVID-19 policy responses had a minimal effect on production, there were widespread disruptions in crop trading. Farmers faced challenges marketing their harvests, as crop traders had to contend with closed commodity exchange centers and border crossings. However, the supply chains adjusted again, and frictions diminished over time as trade resumed both domestically and internationally. With commodity exchange centers closed, crop traders relied on mobile phones to coordinate transactions and avoid curfew violations. Additionally, border gates reopened temporarily to exports, particularly for rice and maize. Ultimately, prices of the main commodities remained mostly stable during the 2020 monsoon harvest period and without the severe disruptions seen in previous years (Goeb et al. 2022; MAPSA 2021a; Oo et al. 2020). One of the more persistent impacts of COVID-19 is related to credit repayment by farmers. Input retailers, crop traders, and rice millers all extended credit to farmers, but repayment rates were slower during COVID-19. In response, many agribusinesses planned to offer less credit in the future.

Although COVID-19 policies did not have seismic effects on food prices or availability, they were a harbinger of the disruptions caused by the coup. During the most stringent lockdowns that accompanied the first two waves of COVID-19, disruptions were large and widespread. Agrifood system actors were able to adapt as restrictions were lifted, marketing continued, and key services like banking and mobile internet went uninterrupted. However, in the absence of these key services following the coup, food system actors faced a different set of challenges.

Shocks to the agrifood system after the February 2021 coup were larger and more lasting than those posed by the first two waves of COVID-19 in 2020. Curfews, safety concerns, and rising fuel costs following the coup led to even larger transportation disruptions than in the COVID-19 lockdowns. Phone surveys were conducted with crop traders, agricultural input retailers, and rice millers at the beginning of 2021 and 2022. At the beginning of 2021, more than 60 percent of each sample reported increased transportation costs; for crop traders, transportation costs increased by an average of 22 percent within their state or region and by 39 percent outside their state or region (MAPSA 2021b, 2021c, 2021e). Increased transportation costs drove a widening wedge between farmgate prices and consumer prices (MAPSA 2022c). Survey data from rice millers showed lower prices paid to farmers for their summer paddy in 2021 compared with 2020, while a survey of food vendors showed rice prices had risen by 11 percent over a similar period. Pulse prices increased in May 2021, mainly because India removed import quotas. However, farmers did not benefit from price gains, as the main harvest period had occurred three months earlier. Further, the coup removed several tools that traders had used to maintain their business activities during COVID-19. Notably, cellphone and internet shutdowns made it difficult to find price and other market information and initiate mobile bank transfers.

Transportation and internet communications challenges affected every level of the agrifood system, from farmers to consumers. However, banking sector disruptions had the most impact on agribusinesses: 86 percent of rice millers, 57 percent of crop traders, and 41 percent of input retailers cited the banking sector as their largest disruption at the beginning of 2021 (Table 3.2). Without access to in-person banking services or the internet for mobile transfers, agricultural trade was heavily reliant on cash. Even when businesses could access a branch, daily and weekly cash withdrawal limits posed a significant

**TABLE 3.2** Perceptions of most important business disruption at beginning of 2021 and 2022

| | Share of respondents (%) | | | | | |
|---|---|---|---|---|---|---|
| | Crop traders | | Rice millers | | Input retailers | |
| Business | March 2021 | March 2022 | March 2021 | March 2022 | March 2021 | March 2022 |
| Banking | 57 | 16 | 86 | 8 | 41 | 7 |
| Telecommunications | 14 | 0 | 6 | 0 | 28 | 1 |
| Transportation[a] | 21 | 76 | 2 | 4 | 22 | 68 |
| Import/export | 4 | 1 | 0 | 0 | 7 | 4 |
| Electricity/fuel problems | 0 | 6 | 0 | 81 | 0 | 10 |
| None or none of these | 4 | 1 | 6 | 7 | 2 | 10 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 |

**Source:** MAPSA 2021a, 2021f, 2021g, 2022c, 2022g, 2022e.
**Note:** [a] For crop traders, this category includes transportation costs, mobility restrictions, and curfews in 2022.

challenge. Crop marketing firms, therefore, had less available working capital than a year earlier and had to reduce their purchase volumes.

In 2022, the main business constraints reported by crop traders, input retailers, and rice millers changed substantially from the previous year. High fuel costs and electricity outages replaced banking system problems as the most important cause of business disruptions (Table 3.2). Rice mills reported that the quantity of monsoon season paddy processed in 2021 declined by 15 percent on average compared with 2020. The leading factor behind this decline was that households were withholding more rice and marketing smaller volumes, though reduced milling time from electricity cuts and diesel shortages also contributed substantially (MAPSA 2022a). More than 90 percent of crop traders reported increased transport costs, up by 74 percent on average over a year earlier, driven by fuel price increases of 168 percent. Transport cost increases were aggravated by curfews and checkpoints related to the security situation. Consequently, 30 percent of traders reported difficulty in contracting transport services (MAPSA 2022f).

Similar market disruptions were seen at the farm level. Table 3.3 shows how access to agricultural services evolved during 2021 and 2022. Access to agricultural extension dropped off significantly following the military coup. During the monsoon season of 2020—during the first two COVID-19 waves—41 percent of crop farmers in Myanmar reported receiving advice on crop agriculture from any source (public, private, nongovernmental organization [NGO], or by phone/internet). One and a half years later, in the 2022 dry season, this share had dropped to 29 percent. The use of all information sources declined, but the most substantial decrease was for public extension

**TABLE 3.3** Access to agricultural extension and credit by crop farmers in 2020, 2021, and 2022

| Characteristic | 2020 Monsoon | 2021 Dry season | 2021 Monsoon | 2022 Dry season |
|---|---|---|---|---|
| *Access to agricultural extension* | | | | |
| Share (%) of farmers who received advice related to crop agriculture from: | | | | |
| Public extension agent | 20.7 | 17.5 | 14.8 | 15.7 |
| Private sector agent | 24.8 | 23.1 | 18.5 | 21.6 |
| Nongovernmental organization (NGO) | 12.8 | 10.7 | 8.8 | 8.8 |
| Cellphone application or internet | 15.7 | 13.8 | 15.2 | 14.9 |
| Any source | 41.3 | 29.0 | 34.4 | 28.6 |
| *Access to agricultural credit* | | | | |
| Share of farmers who took any credit for farm production (%) | 59.6 | 45.7 | 46.4 | 43.7 |
| If not taken, what was the reason? (% of farmers) | | | | |
| Not needed (buy input in cash) | 74.6 | 69.8 | 61.2 | 66.7 |
| Tried to take credit but could not find | 12.0 | 12.1 | 10.4 | 12.8 |
| Conditions for credit not good | 4.3 | 2.4 | 3.8 | 2.7 |
| Did not pay back last year's credit | 3.3 | 5.3 | 17.5 | 7.6 |
| If credit taken, sources of credit (%) | | | | |
| Private moneylender | 10.2 | 10.4 | 12.2 | 11.1 |
| Relative/friend | 13.7 | 17.6 | 16.3 | 18.4 |
| MADB (COVID-19 fund and others) | 60.0 | 49.3 | 49.5 | 47.7 |
| Department of Cooperatives (MOALI) | 4.1 | 2.1 | 4.4 | 2.0 |
| Microfinance institution/NGO | 14.8 | 14.2 | 15.3 | 14.0 |
| Rice or oil mill | 0.5 | 0.4 | 1.0 | 0.4 |
| Agricultural input supplier | 6.4 | 8.1 | 7.0 | 9.2 |
| Agricultural trader | 3.6 | 2.5 | 4.2 | 2.8 |
| Agricultural machine supplier | 0.0 | 0.1 | 0.0 | 0.1 |
| Private bank | 1.3 | 0.6 | 1.2 | 0.7 |
| Revolving fund (Mya Seing Yang) | 11.5 | 8.6 | 13.2 | 8.9 |

**Source:** Authors' calculations using Myanmar Agricultural Performance Survey (MAPS) (IFPRI 2023) data.
**Note:** MADB = Myanmar Agricultural Development Bank. MOALI = Ministry of Agriculture, Livestock, and Irrigation.

agents—in part due to a high share of MOALI extension agents who participated in the Civil Disobedience Movement following the military coup (Chapter 1). Between the monsoons of 2020 and 2021, farmers reduced their use of public extension by 6 percentage points (Table 3.3). The use of advice from the private sector and NGOs also declined. Access to agricultural advice through the internet or smartphone applications, such as Facebook, Htwet Toe, Greenway, and Golden Paddy, stayed relatively stable over the four seasons and even increased between the dry seasons of 2021 and 2022.

Access to timely credit is important for farmers to acquire inputs. Access to credit declined significantly over the four seasons between 2020 and 2022 (Table 3.3). While 60 percent of farmers took credit for farm production in the 2020 monsoon season, this declined to 44 percent in the 2022 dry season. While 75 percent of farmers who did not take credit indicated that they did not need it during the monsoon season of 2020, that share dropped to 67 percent in the dry season in 2022, likely indicating an increasing shortage of good sources of credit. The Myanmar Agricultural Development Bank (MADB) is typically a major provider of agricultural credit, especially for rice-producing areas (MADB issued almost $1 billion in monsoon loans from May to September 2020, in addition to the 600 billion kyat [$400 million] issued from a COVID-19 special relief fund). However, given the issues with loan repayments from the previous season and the difficulties with financial service delivery in rural areas, MADB credit provision has been substantially less than normal. The portfolios of most microfinance institutions are typically less geared toward agriculture, but the further reduction in their activities—linked to lack of liquidity (owing to low collection and saving rates) and constraints posed by withdrawal limits—also hampered credit availability for the agriculture sector and the rural sector more broadly (MAPSA 2021e). Over time, given the lack of available formal sources, informal credit became increasingly important for farmers—mostly from relatives and friends but also from input suppliers (Table 3.3).

In 2022, conflict-related security issues in rural areas became an increasing problem for farmers. A survey of more than 5,000 farmers from August 2022 to September 2022 found that 27 percent reported feeling "very insecure" or "insecure" during that period, an increase of 9 percentage points compared with the beginning of the year (MAPSA 2022g). One in four farmers reported that they could not move around without serious security concerns, while 8 percent reported that some agricultural fields in their area could not be cultivated because of conflict. Conflict-affected areas suffered substantially more from problems with agricultural input accessibility.

A combination of sharp increases in input costs and decreased liquidity led to reduced investment by farmers in production inputs. International inorganic fertilizer prices and shipping costs increased substantially in 2021 compared with a year earlier, which resulted in significantly higher border prices for fertilizer in Myanmar. The impacts of the political crisis on the local transport sector and the depreciation of Myanmar's currency further increased domestic fertilizer prices. Urea prices—the most important chemical fertilizer in the country—were 68 percent higher in the monsoon season of 2021 compared with a year earlier. Prices continued to rise by a cumulative 143 percent by the dry season, when farmers usually apply higher rates to their irrigated rice crop. This was a significant development because fertilizers are the largest purchased input for Myanmar farmers, constituting 30 percent of the value of all inputs purchased. Furthermore, prices charged for land preparation also increased in the 2021 monsoon season and the 2022 dry season (an approximate increase of 20 percent per year).

In contrast to input prices, farmgate prices for crops initially changed little after the harvest of the monsoon season of 2021, resulting in a squeeze on farmer returns. A year later, the situation was quite different, when farmgate prices for paddy, for example, rose 45 percent higher in August/September 2022. Table 3.4 further shows that retail prices increased much more rapidly than farmgate prices. The cost of the food basket for an average

**TABLE 3.4** Input, farmgate, and retail prices, 2020, 2021, and 2022

| | | Levels (median) | | | | % change compared with a year earlier | |
|---|---|---|---|---|---|---|---|
| **Farm input prices** | **Unit** | **2020 Monsoon** | **2021 Dry season** | **2021 Monsoon** | **2022 Dry season** | **2021 Monsoon** | **2022 Dry season** |
| Urea | kyat/kg | 740 | 1,200 | 1,240 | 1,800 | 67.6 | 50.0 |
| Male wages | kyat/day | 6,000 | 6,000 | 6,000 | 6,000 | 0.0 | 0.0 |
| Female wages | kyat/day | 5,000 | 4,000 | 5,000 | 5,000 | 0.0 | 25.0 |
| Cost of plowing | kyat/acre | 25,000 | 33,000 | 30,000 | 40,000 | 20.0 | 21.2 |
| **Farmgate prices** | | **March 2021** | **Aug./Sept. 2021** | **March 2022** | **Aug./Sept. 2022** | **March 2022** | **Aug./Sept. 2022** |
| Paddy | kyat/kg | 335 | 330 | 359 | 478 | 7.2 | 44.8 |
| Green gram | kyat/kg | 1,223 | 1,223 | 1,223 | 1,468 | 0.0 | 20.0 |
| Sesame | kyat/kg | 1,837 | 1,837 | 2,041 | 3,061 | 11.1 | 66.6 |
| Groundnut | kyat/kg | 1,053 | 1,053 | 2,041 | 1,754 | 93.8 | 66.6 |
| **Retail prices** | | **May 2021** | **Aug./Sept. 2021** | **March 2022** | **Aug./Sept. 2022** | **March 2022[a]** | **Aug./Sept. 2022** |
| Cost of food basket—average diet | kyat/day/adult woman | 871 | 915 | 1,089 | 1,476 | 25.0 | 61.4 |
| Cost of food basket—healthy diet | kyat/day/adult woman | 1,255 | 1,276 | 1,495 | 2,080 | 19.1 | 63.0 |

**Source:** Authors' calculations using MAPS data for farm input and farm output (farmgate) prices; MAPSA (2023) for costs of food baskets.

**Note:** [a] For retail prices, comparison month for March 2022 changes compared with a year earlier is May 2021.

diet and for a healthy diet in August/September 2022 was 61 and 63 percent higher, respectively, than a year earlier, indicative of a high food price inflation rate. Increases in retail prices in 2022 and 2021 were generally higher than farmgate prices, indicative of increasing marketing margins after the military coup.

## Regional benchmarking of Myanmar's agrifood system

### Agricultural production and productivity

To assess agricultural production performance in Myanmar from a regional perspective, we look first at the adoption of improved agricultural technologies. A critical input for improved performance is the use of improved seeds. Unfortunately, up-to-date and statistically reliable data are not available at the national level. Based on a survey carried out in 2013, the World Bank (2019b) estimated that less than 7 percent of farmers used certified seeds. It also estimated that the supply of certified rice seeds would satisfy less than 1 percent of potential demand. Boughton and colleagues (2020) conducted a large survey in the Dry Zone in 2019. They found that the adoption of improved varieties in their study area was relatively low—the highest adoption of improved seeds was 41 percent for sunflower; it was lowest for pigeon pea at 8 percent. In contrast, for the same crops in Bangladesh, China, India, Thailand, and Viet Nam, adoption rates were estimated to be more than 90 percent. Limited access to quality seed is problematic in Myanmar, and most farmers therefore rely on their own saved seeds or informal trusted channels, inhibiting the spread of improved varieties (Boughton et al. 2020).

Although international comparative data—for example, the World Bank's World Development Indicators database—put chemical fertilizer use at low levels in the past, it is currently significantly higher (Chapter 10). Based on a large survey conducted in 2013, the World Bank (2019b) compared the fertilizer use of Myanmar's farmers with that of farmers in other Asian countries (Table 3.5). It found that Myanmar's chemical fertilizer use was significantly below that of peer countries—21 percent of China's, 43 percent of Viet Nam's, 45 percent of India's, and 59 percent of Thailand's. It also identified the use of improper combinations of chemical fertilizers as a major issue. This is linked to a lack of knowledge in the area and leads to lower returns on fertilizer use than in other countries in the region. Major changes have occurred since the World Bank study, though, and Myanmar may have partly closed the gap,

**TABLE 3.5** Fertilizer use by macronutrient, Myanmar and neighboring countries, 2013

| Fertilizer | China | India | Myanmar | Thailand | Viet Nam |
|---|---|---|---|---|---|
| | | | Nutrient use (kg/hectares) | | |
| Nitrogen (N) | 198 | 105 | 53 | 88 | 99 |
| Phosphorus (P) | 29 | 21 | 15 | 22 | 31 |
| Potassium (K) | 110 | 33 | 3 | 10 | 35 |
| | | | Share in total use (%) | | |
| Nitrogen (N) | 59 | 66 | 75 | 65 | 60 |
| Phosphorus (P) | 9 | 13 | 21 | 16 | 19 |
| Potassium (K) | 33 | 21 | 4 | 19 | 21 |

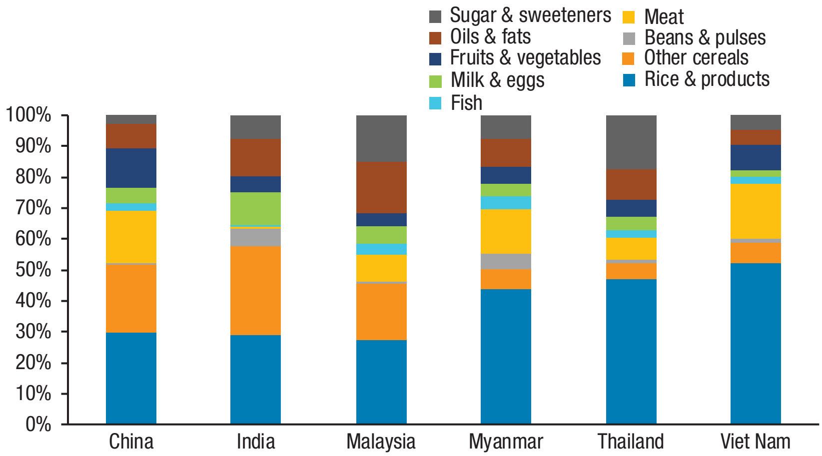
**Source:** World Bank (2016).

as fertilizer imports in 2019 were more than double the quantities imported in 2013.

To assess agricultural diversification, we look at the importance of different crops and products in agricultural output in Myanmar compared with Asian peer countries. Figure 3.2 shows the high share of rice in total food calories per capita. However, the shares in Thailand and Viet Nam are still higher. Other cereals beyond rice are relatively less important in Myanmar. The livestock and fisheries sectors are also shown to be relatively important, but less so than in China and Viet Nam.

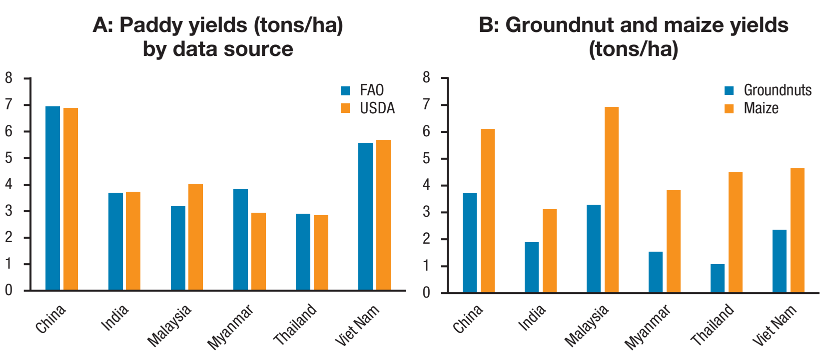
Using data from the Food and Agriculture Organization of the United Nations (FAOSTAT 2023) and the United States Department of Agriculture (USDA), we further compare yields of three of Myanmar's major crops—rice, groundnut (as a crop representing the important oilseeds sector), and maize—to those of its neighbors (Figure 3.3). Among these countries, this effort shows that Myanmar is typically among the worst performers for each crop. For rice, Myanmar's most important crop in terms of area planted, we see that yields (using the more reliable USDA estimate) are at the same level as in Thailand but much lower than in other countries. Rice yields are almost twice as high in Viet Nam and more than twice as high in China compared with Myanmar. In the case of groundnut, Myanmar performs better than Thailand but still lags other countries. Groundnut yields are more than 50 percent higher in Viet Nam. For maize, where Myanmar has recently seen some improvements through the widespread adoption of hybrid seeds, yields are higher than in India but lag all other countries, although not by much compared with Thailand and Viet Nam. China and Malaysia top the list, with average yields of about 6 and 7 tons per hectare, respectively.

**FIGURE 3.2** Shares of different food groups in total agricultural output (expressed in calories per capita), Myanmar and neighboring countries, 2017




**Source:** Data from FAOSTAT database (FAO 2023).

**FIGURE 3.3** Crop yields, Myanmar and neighboring countries, 2017




**Source:** FAOSTAT (FAO 2023) and USDA for paddy; FAOSTAT for groundnuts and maize.

**Note:** FAO = Food and Agriculture Organization of the United Nations. USDA = United States Department of Agriculture.

## Consumption

One major driver of agrifood system change is rapidly changing food consumption, often driven by urbanization and income growth. As consumers become wealthier, they typically shift away from low-priced cereals to more expensive preferred foods, such as fish, meat, dairy, eggs, fruits, and vegetables—all generally healthy—and to more processed foods and food away from home (FAFH)—both generally unhealthy.

Figure 3.4 shows the share of rice and animal-source foods (ASFs) in household food expenditures for five Asian countries, including Myanmar, in 2015. We note the high share of ASFs in the budget of Myanmar consumers compared with Asian peers and the already relatively low share of rice. Whereas all the urban areas in Asia spend relatively more on ASFs than on rice, the rural areas in Myanmar are doing so as well, which is unique among the Asian countries reported. While the share of rice in food expenditures is relatively low compared with other countries, its contribution to calories is still predominant—that is, 51 percent and 60 percent in urban and rural areas, respectively, in 2015 (Chapter 4).

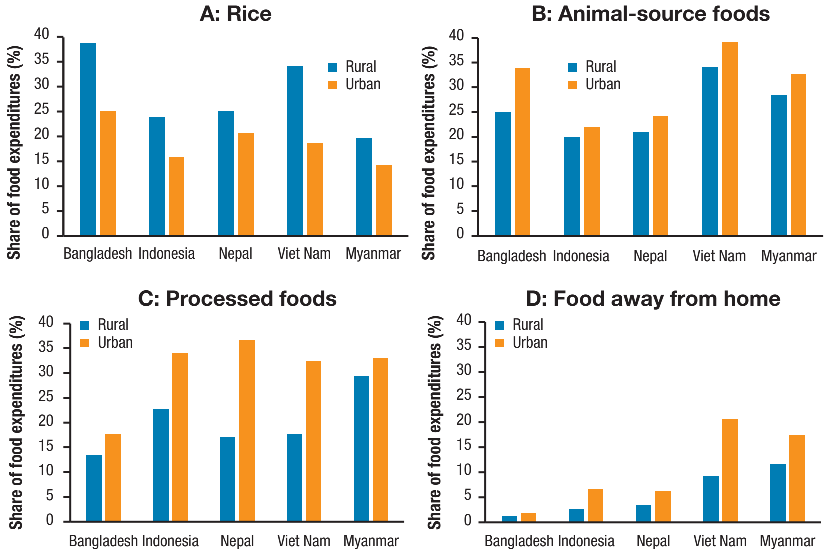
Another important global change in food consumption patterns is the increasing importance of processed foods and FAFH. Figure 3.4 shows the importance of these two categories in food baskets in Myanmar and other Asian countries. The consumption of processed foods is already important in Myanmar—in 2015, the share of processed food in the value of food consumption among urban households was 31 percent, while among rural households, it was 26 percent. Myanmar's share of processed food consumption in rural areas is the highest among all Asian countries. For urban areas, the share is higher than in Bangladesh but lower than in the other three countries. We also note the important share of FAFH. Except for urban areas of Viet Nam, Myanmar's share of FAFH in total food consumption is the highest of all Asian countries, at 12 percent in rural areas and 18 percent in urban areas.[1] This large share of processed foods and FAFH in total food consumption has important implications for the off-farm segment of the agrifood system, be it for employment or value addition (Chapter 13). It may also have important implications for the gender division of tasks. Higher consumption of FAFH and processed foods implies that women's time is potentially freed up for other activities.

## Food value chains

Food markets are the main source of food for Myanmar's consumers, even in rural areas, and thus their efficiency affects affordability. Figure 3.5 shows what share of food is purchased in the total value of food consumed, with the difference being food consumed from a household's own production. It shows

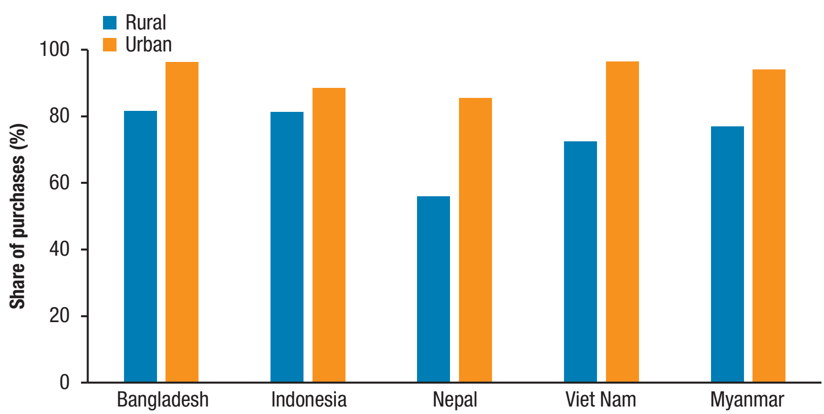
1 For processed foods, we follow the definition of Reardon et al. (2014). Three criteria are considered: (1) food with multiple ingredients added (like cookies with several ingredients); (2) alteration of form with additional processing steps added (cooking, extruding, freezing, adding chemicals or flavors, and so on, as with potato chips); and (3) complex packaging like a bottle or can. Any item with two or three of the above characteristics is categorized as processed.

**FIGURE 3.4** Share of rice, animal-source foods, processed foods, and food away from home in total value of food consumption, Myanmar and neighboring countries




**Source:** Authors' analysis using MPLCS (2015) in Myanmar; Reardon et al. (2014) for other countries.

**FIGURE 3.5** Share of food purchases in value of food consumed, Myanmar and neighboring countries




**Source:** Authors' analysis using MPLCS (2015) in Myanmar; Reardon et al. (2014) for other countries.

that purchased food shares total more than 50 percent in the five countries, even in rural areas. In Myanmar, based on the 2015 national household survey, the share of purchased food was, on average, 77 percent in rural areas and 94 percent in urban areas. These shares are comparable to those of other countries in the region—except for Nepal, which shows less reliance on food markets—and indicates the importance of food value chains in delivering food to consumers in Myanmar.

When agricultural produce is marketed and sometimes processed, the additional costs and profits result in a difference in price between producers and consumers, known as a price "wedge" or margin. The size of these margins may indicate how well agricultural value chains function. Table 3.6 shows the share that farmers received of wholesale and export market prices for rice in several Asian countries—the lower the share, the higher the margin. Two factors can explain the relatively larger margins in Myanmar compared with other countries. First, the milling sector in Myanmar often operates with obsolete processing units, leading to quality and quantity losses of 15 to 20 percent during milling, much higher than in other countries. Second, marketing costs are higher than in other countries, often linked to high transport and export costs (World Bank 2019b).

Finally, a comparative overall assessment of agrifood system performance was carried out for 113 countries using indexes based on 34 indicators (Table 3.7). In this assessment, the affordability index measures the ability of consumers to purchase food, their vulnerability to price shocks, and the presence of programs and policies to support them when shocks occur. The availability index measures the sufficiency of the national food supply, risk of supply disruption, national capacity to disseminate food, and research efforts

**TABLE 3.6 Farmers' share in final rice prices at different market levels, Myanmar and neighboring countries**

| | | Cambodia | Myanmar | | | Thailand | Viet Nam |
|---|---|---|---|---|---|---|---|
| Farmers' share (%) | Year | | Overall | High quality | Low quality | | |
| … of wholesale market in capital city rice price | 2013 | 53 | 47 | — | — | 77 | 64 |
| … of free on board rice price | 2013 | 48 | 49 | — | — | 70 | 63 |
| … of average wholesale market rice price | 2017 | — | — | 60 | 55 | 76 | 79 |

**Source:** World Bank (2016); Ekanayake, Ambrosio, and Jaffee (2019).
**Note:** — = data not available.

**TABLE 3.7** Global Food Security Index, Myanmar and neighboring countries, 2019

| Index | Unit | China | India | Malaysia | Myanmar | Thailand | Viet Nam |
|---|---|---|---|---|---|---|---|
| Availability | Score | 66.9 | 58.4 | 67.7 | 57.2 | 58.7 | 59.7 |
| | Rank (113 countries) | 27 | 61 | 26 | 69 | 59 | 55 |
| Affordability | Score | 74.8 | 64.2 | 81.7 | 59.1 | 77.1 | 75.1 |
| | Rank (113 countries) | 50 | 70 | 28 | 78 | 42 | 48 |
| Quality and safety | Score | 72.6 | 47.0 | 70.6 | 51.3 | 52.6 | 51.7 |
| | Rank (113 countries) | 38 | 85 | 42 | 78 | 75 | 77 |

**Source:** Economist Intelligence Unit (2019).

to expand agricultural output. The quality and safety index measures the variety and nutritional quality of average diets as well as the safety of food. While Myanmar's quality and food safety score is similar to the scores of India, Viet Nam, and Thailand—in all cases being relatively low—it ranks worse than all peer countries for food availability and affordability (Table 3.7).

## Drivers of and constraints to the transformation of Myanmar's agrifood system: Insights from history and peer countries

### Drivers of change

Drivers of agricultural growth can be divided into those affecting the demand side of the market and those affecting the supply side. The demand side is the sum of export and domestic demand. Population growth, income growth, and urbanization affect the amount and type of food people purchase and consume. While population growth leads to increases in the amount of energy and protein needed to sustain the population, income growth results in an increase in the demand for diversified diets (that is, an increased share of food expenditures on meat, fish, eggs, dairy products, and fruit relative to staple cereals such as rice), and urbanization results in greater demand for convenience (that is, labor-saving value addition, packaging, and prepared meals).

Meeting these demands requires important changes on the supply side of the agrifood system. Agricultural production needs to diversify, the value produced per farm worker (labor productivity) needs to increase, and expanded investments need to be made in the cold chain (refrigeration), agro-processing, and wholesale and retail food distribution sectors. Farmers and businesses also need additional investment in science-based innovations, such as high-yielding, disease-resistant crop varieties; infrastructure, such as irrigation, roads, electricity distribution, and wholesale markets; and regulations and laboratory facilities to ensure food safety and hygiene. When the domestic agrifood system is unable to adapt quickly enough, prices rise, and food demand is increasingly met through imports rather than domestic production. We examine the extent to which these drivers have shaped the agrifood system in recent years, first on the demand side and then on the supply side. We also briefly consider international trade.

### DOMESTIC DEMAND-SIDE DRIVERS

Income or the lack of it—that is, poverty—is a key factor affecting the amount and composition of demand for food. While the poverty head count in Myanmar fell from 48 percent of the population to 25 percent between 2005 and 2017, this rate is still very high (CSO, UNDP, and World Bank 2019). Poverty is an overwhelmingly rural phenomenon in Myanmar. Spatial variations in rates of food poverty (the inability to purchase a minimum amount of food) are stark. More than twice as many households in the Coastal and Hills and Mountains agroecological zones (19 percent and 16 percent, respectively) are estimated to be food poor, compared with 7 percent in both the Dry Zone and Delta. Nevertheless, malnutrition indicators have improved with poverty reduction: wasting rates decreased from 10.7 percent in 2000 to 7 percent in 2016, and stunting rates fell from 40 percent in 2000 to 29 percent in 2015 (MoHS and IFC 2017).

Approximately 30 percent of Myanmar's population lives in urban areas. Growing at 2 percent per year, the urban population is expected to increase by an additional 7.1 million people by 2050 (World Bank 2019a). Urban households typically spend smaller shares of their food budget on rice and larger shares on poultry, eggs, meat, seafood, dairy, fruit, and FAFH than rural households (Table 3.8). Across consumption expenditure quintiles, similar patterns are seen. As per capita expenditure increases, households' share of food expenditure on rice falls dramatically, from 31 percent to 12 percent, as do their expenditure shares on vegetables, oils, and condiments. In contrast, sharp increases emerge in FAFH, which quadruples from 5 percent of total food expenditure in the poorest quintile to 20 percent in the top expenditure quintile. As incomes rise, similar increases occur in expenditure shares on processed foods, poultry, other meats, fresh fruit, and fish (Table 3.8).

Similar patterns emerge over time. Between 2010 and 2015, rural and urban households of all income levels reduced their share of expenditure on rice in food consumed at home from 23.6 percent to 20.7 percent, averaged

**TABLE 3.8** **Expenditure shares for different food types, by quintile of total household food expenditure, 2017**

| | Expenditure share by consumption expenditure quintile (%) | | | | | Expenditure share by location (%) | | |
|---|---|---|---|---|---|---|---|---|
| Food groups | Q1 (poorest) | Q2 | Q3 | Q4 | Q5 (richest) | Rural | Urban | National |
| Rice | 31 | 25 | 20 | 16 | 12 | 20 | 14 | 18 |
| Other cereals | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Tubers and roots | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 1 |
| Dark green leafy vegetables | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 |
| Other vegetables | 11 | 10 | 10 | 9 | 7 | 10 | 8 | 9 |
| Fruits | 3 | 4 | 4 | 5 | 7 | 5 | 7 | 5 |
| Poultry | 4 | 6 | 6 | 7 | 7 | 6 | 8 | 6 |
| Other meat | 4 | 6 | 7 | 7 | 8 | 7 | 7 | 7 |
| Eggs | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Milk and milk products | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| Fish and other seafood | 11 | 12 | 13 | 13 | 14 | 13 | 14 | 13 |
| Legumes, nuts, and seeds | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| Oils and fats | 7 | 6 | 5 | 5 | 4 | 5 | 4 | 5 |
| Sweets | 2 | 3 | 4 | 4 | 4 | 4 | 4 | 4 |
| Spices, condiments, beverages, other | 9 | 9 | 9 | 7 | 5 | 8 | 5 | 7 |
| Alcohol | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| Food away from home (FAFH) | 5 | 7 | 10 | 14 | 20 | 12 | 17 | 13 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Processed foods | 17 | 20 | 25 | 28 | 34 | 26 | 31 | 28 |

**Source:** Authors' calculations using 2017 Myanmar Population and Living Conditions Survey data (CSO 2019).

across all households. Despite changes in food expenditure shares over time, most households do not consume sufficiently diversified diets. Only 38 percent of households consume the recommended quantities of protein-rich foods and fats and oils, 16 percent the recommended quantities of vegetables, and 9 percent of fruits. The primary constraint to achieving a nutrient-rich diet is the high cost of protein-rich foods relative to household food expenditure (Chapter 4). Meanwhile, increases in the consumption of processed foods high in refined sugar are likely to result in a higher incidence of diabetes.

### DOMESTIC SUPPLY-SIDE DRIVERS

The following discussion first examines factors underlying changes in crop production and then turns to changes in the livestock sector. Increases in the value of crop output per worker can potentially come from reallocating land to higher value crops, increasing yields from irrigation, or using improved varieties and crop management practices that can expand the area cultivated per worker or reduce labor use, such as through use of agricultural machinery or herbicides. Among these potential sources of change, only one has made a significant contribution in the recent past: the substitution of labor by mechanization as a response to out-migration of labor and, hence, increasing real wages.

**Migration, rural wages, and mechanization.** Migration has accelerated rapidly over the past 10 years, becoming a key driver of rural change. In Mon State, almost one out of two households has at least one migrant member, most often in neighboring Thailand (Filipski et al. 2020). The outflow of young, economically active workers has led to a tightening of rural labor markets, which, in turn, has led to higher wages. In both the Dry Zone and Delta, for example, real rural wages (adjusted for inflation) jumped by more than one-third over the five years from 2011/12 to 2016/17. However, real wages have declined substantially in the recent crisis years (Chapter 16).

The association between the rate of out-migration and rural wages is demonstrated in Mon State, where townships closer to Thailand have greater numbers of migrant households and significantly higher local wage rates than townships farther from the border (Filipski et al. 2020). The recent growth in the number of secondary schools may have helped reduce children's participation in the workforce, further contributing to wage increases. These real wage increases have declined since the beginning of 2021, likely adding to further migration.

Real wage increases of this magnitude have positive implications for the welfare of the many households that depend on off-farm employment, but they also create new vulnerabilities. Welfare gains are undermined by a large gender wage gap in all locations surveyed. In both the Dry Zone and Delta, for example, women earn between 15 percent and 35 percent less on average than men for casual agricultural or nonfarm work. This gap does not appear to have changed over time. The growth in dependence on remittance income also puts households at risk of income shocks if migrants lose employment, such as from crises like the COVID-19 pandemic.

Demand for agricultural mechanization services has increased rapidly in response to rising wages and labor shortages. On the supply side, three factors have encouraged the availability of such services: (1) the expansion since 2013 of financing from private banks to purchase agricultural machinery, (2) the ability of farmers since 2012 to use land use certificates as loan collateral, and (3) the falling real cost of imported machines. However, mechanization providers now struggle to provide the same services as before the current crisis began (MAPSA 2022b).

**Limited crop diversification.** Unlike the situation for mechanization, farmers' cropping patterns have changed little over the past decade (for example, Mather et al. 2020). In the decade before 2020, the share of cereals increased slightly, driven primarily by the expansion of maize in Shan State as a result of rising demand for animal feed domestically and in neighboring countries, and the availability of hybrid seed. Among oilseed crops, shares of cropped area under groundnut and sesame have increased, while the share under sunflower has declined. Groundnut and sesame are widely used in specialty dishes, such as tea leaf salad, and pure groundnut and sesame oils are highly prized in the market. Sunflower shares have lagged due to low yields, which is related to lack of access to hybrid varieties and to competition from imported palm oil. However, to reduce dependency on palm oil, the military government recently began promoting sunflower production.

Among pulses, shares of green gram and chickpea have increased slightly. Chickpea is used widely in Myanmar dishes, and green gram has multiple export destinations. Shares of pigeon pea, in contrast, have declined. This pulse is narrowly targeted to the Indian market and experienced a sharp drop in export prices when India imposed import quotas. Industrial crops such as cotton have lost almost half their share over the past decade because of a lack of competitiveness.

Reasons for limited crop diversification include agroecological constraints, land use regulations, issues with access to finance, and risk. Agroecological constraints (discussed further in Chapter 5) include heavy and increasingly unpredictable rainfall in the Delta and Coastal agroecological zones, which limits the range of crops that can be grown. By contrast, Shan State and other areas of the Hills and Mountains have much higher crop diversification due to more temperate climatic conditions.

In terms of land use regulation, while the new agricultural policy has allowed freedom of seasonal crop choice, the permanent conversion of paddy land to alternative uses, such as orchards, livestock, or aquaculture, still requires approval at multiple levels. Existing MOALI-managed irrigation systems do not allow for water control at the individual plot level, effectively precluding freedom of crop choice by the individual farmer. Only a small proportion of farmers belong to water user groups that could facilitate collective decision-making. Private tubewells using groundwater can avoid this constraint, but groundwater reserves are not adequately mapped. This leads to uncertainty about water depth, hence, the cost of well drilling, and sustainable extraction rates. Loans for private tubewell development from the formal financial sector are nonexistent.

Meanwhile, diversification into perishable crops such as cut flowers, melons, or vegetables can be quite risky, given the volatility in prices. Investment in value-added processing facilities, such as for cold storage, grading and packing, or processing, can expand market options and reduce downside price risk, but investment in such facilities is sorely lacking. Contract farming can also reduce risks but works only when farmers and buyers have strong incentives to respect commitments. In sum, like enterprise diversification more generally, crop diversification requires market access and a set of supportive conditions.

**Low crop productivity and profitability.** A key potential driver of the agriculture sector is productivity growth from improved varieties (or animal breeds) combined with improved crop (or livestock) management practices. However, as noted, yields have declined for most crops except post-monsoon irrigated rice and hybrid maize. In turn, low yields reflect minimal uptake of improved varieties for all crops, except irrigated paddy,[2] and low levels of input use. Inorganic fertilizer, pesticide, and herbicide use have increased slightly over the past 10 years for all Dry Zone crops and for irrigated paddy in the Delta. Despite this, post-monsoon irrigated paddy is the only crop to show (small) yield gains. Increased input use may not translate into observable yield gains for several reasons. Farmers may not know the correct inputs needed for their conditions or may apply them at the wrong time. Also, the switch from transplanting to broadcast seeding of paddy, which has been commonly

2 A recent study of varietal adoption and demand for quality seed in the Dry Zone found limited adoption of improved varieties by farmers despite such varieties being available for almost all crops (Boughton et al. 2020). The authors advocate for more extensive variety evaluation and seed quality demonstration programs on farmers' fields. Such programs could enable researchers to learn about the performance of new varieties under farm conditions while increasing farmer awareness of their potential benefits.

observed but not systematically measured, reduces labor costs but also yields potential, especially in the monsoon season.

**Livestock.** In contrast with crop production, livestock has performed strongly in recent years. Poultry and egg production has done well, as has aquaculture. In both cases, private sector investment throughout the value chain has driven growth. Of critical importance has been an expansion in the number of commercial feed companies, some based on investment from the Netherlands and Republic of Korea. This has contributed to an expansion of maize production. There has also been a surge in live cattle exports thanks to strong demand from neighboring countries. However, it takes longer to scale up cattle production than poultry and egg production. There has been no investment in agricultural research and extension to improve the forage crops or pasture needed for ruminants like cattle. The livestock subsector performed strongly before the crisis years, but it also has seen some of the biggest challenges to its operations since that time.

#### INTERNATIONAL TRADE CHANGES

Agricultural exports can supplement domestic food markets and significantly expand opportunities for agricultural growth, as in the case of Myanmar's pulse exports to India and maize exports to China and Thailand. However, these export markets have proven volatile and risky, with export quantities and prices subject to rapid spikes and abrupt declines (Chapter 14). Pulse exports to India were reduced by quotas before they were relaxed in 2021. Bans on maize imports in China limited exports to its markets. International price volatility has led to wide swings in prices for many commodities, including rubber, pulses, and maize. Compounding these problems is the generally low productivity of Myanmar's farmers and limited value-added processing, hampering competitiveness and confining the country's exporters to low prices in often volatile international markets. At the farm level, such price characteristics do not encourage investment by farmers in either quality or productivity.

### Constraints

#### PROBLEMATIC INPUT AND FACTOR MARKETS

**Highly skewed access to agricultural land.** Access to land for farming in Myanmar remains highly skewed, with more than half of rural households having no access to farmland despite agriculture being an important source of livelihood (Chapter 6). This reflects a long history of dispossession, whether through bankruptcy brought on by the paddy quota system or land confiscation by the government. Even among landed households, there is a high degree of inequality in landownership: the top 20 percent of households with the largest farm sizes own 55 percent of total land. In comparison, households at or below the 60th percentile of farm size own just 22 percent (Chapter 6). In addition to inequitable land distribution, farmers are not allowed to convert land designated as paddy land to more profitable permanent alternative uses such as aquaculture. The process for obtaining permission to change land use is complex, time-consuming, and fraught with rent-seeking by local officials.

**Underperforming agricultural research.** Investments in agricultural research are central to improving agricultural performance over time. Compared with other countries in the region, Myanmar's low yields partly reflect minimal investment in research and human capacity. Table 3.9 shows that Myanmar spends less than 0.1 percent of its agricultural GDP on agricultural research. In contrast, Thailand spends 16 times as much, and Viet Nam—the region's second-lowest spender on agricultural research—spends 3 times as much. Other metrics, such as expenditure per capita or per rural resident, are also extremely low. Myanmar has very few aquaculture or fisheries researchers and no livestock researchers other than faculty members at the veterinary university who supervise research by their students. This low investment in agricultural research is compounded by weak extension linkages, which translate into low rates of varietal adoption (Boughton et al. 2020).

Figure 3.6 further shows the limited number of agricultural researchers and the relatively low proportion of MSc and PhD degree holders in Myanmar's agricultural research system. This reflects the situation before the crisis years, but the situation has since worsened significantly.

Stads and colleagues (2020) assess to what extent increased expenditure on agricultural research would benefit the agriculture sector in Southeast Asia overall. They find that all countries in the region are underinvesting in agricultural research and that increased spending would lead to considerable growth in agricultural productivity, especially in Myanmar. Their analysis of a closing-the-gap scenario—under which growth in agricultural research investments is set at rates that will gradually close the investment gap by 2030 and keep it closed until 2050[3]—indicates that Myanmar's annual productivity growth could reach a 7.7 percent scenario.

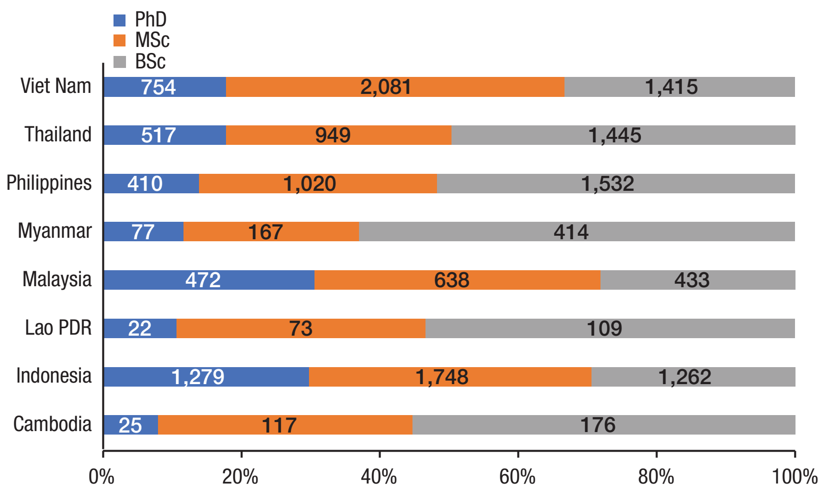
3 This implies a 10-fold increase in R&D investments from about US$47 million annually in 2017 (0.06 percent of agrifood system GDP [AgGDP]) to about US$470 million in 2030 and the years

**TABLE 3.9** Investments in agricultural research, Myanmar and neighboring countries, 2017

| Country | US$ million[a] | % of agricultural GDP | US$ per capita[a] | US$ per capita of rural population[a] |
|---|---|---|---|---|
| India | 4,172 | 0.30 | 3.12 | 4.69 |
| Thailand | 847 | 0.94 | 26.79 | 109.10 |
| Malaysia | 629 | 0.85 | 11.79 | 16.91 |
| Bangladesh | 288 | 0.38 | 4.17 | 8.21 |
| Viet Nam | 178 | 0.20 | 1.86 | 2.87 |
| Myanmar | 47 | 0.06 | 0.28 | 0.44 |

**Source:** ASTI database, accessed December 2020.
**Note:** [a] Constant 2011 values.

**FIGURE 3.6** Agricultural researchers by degree, Myanmar and neighboring countries, 2017




**Source:** Stads et al. (2020).
**Note:** PDR = People's Democratic Republic.

**Lack of agricultural extension.** Agricultural extension can facilitate the adoption of new agricultural technologies. While MOALI employed more than 60,000 people before the military coup, only about 8,200 were extension

after (0.61 percent of AgGDP, called the "attainable investment level") (Stads et al. 2020). Stads and colleagues (2020) developed "attainable" investment targets for each country based on the size of their agriculture sector and total economy, their income level, and the availability of relevant technology spillovers from other countries.

agents. There are many private extension agents in the country,[4] but their overall number is still small compared with the total number of farmers and area of cultivated agricultural land (Figure 3.7). Myanmar has one extension agent for every 4,135 farmers, compared with one for every 2,600 farmers in Thailand. Even before the military coup, agricultural extension workers did not visit farmers frequently, and have done so even less often since the coup.

**Low access to rural finance.** Lack of access to finance was a common constraint facing agrifood system actors prior to COVID-19 and one that worsened during the pandemic. Before the February 2021 coup, more than 70 percent of the population lacked access to formal finance. The underdeveloped finance sector was not able to meet the financing needs of private firms (IFC 2020). Domestic credit to the private sector was 25.7 percent of GDP in 2019, one of the lowest rates in East Asia and the Pacific.[5] Moreover, while the agrifood system represents one-third of GDP and employs about half of the working population, only 2.5 percent of all loans are related to agriculture (IFC 2020). The microfinance sector and cooperatives have expanded their services rapidly in recent years, but many farmers remain unserved or underserved (Basu et al. 2020), especially since the recent crises (MAPSA 2021e). Therefore, a substantial share of farmers, traders, and other agribusinesses relies on informal markets that charge high interest rates. At the farm level, the limited access and high cost of finance can restrict the adoption of improved agricultural inputs, high-value crops, and improved quality and safety practices. Downstream actors similarly face reduced incentives to invest in efficient marketing, processing, and storage.

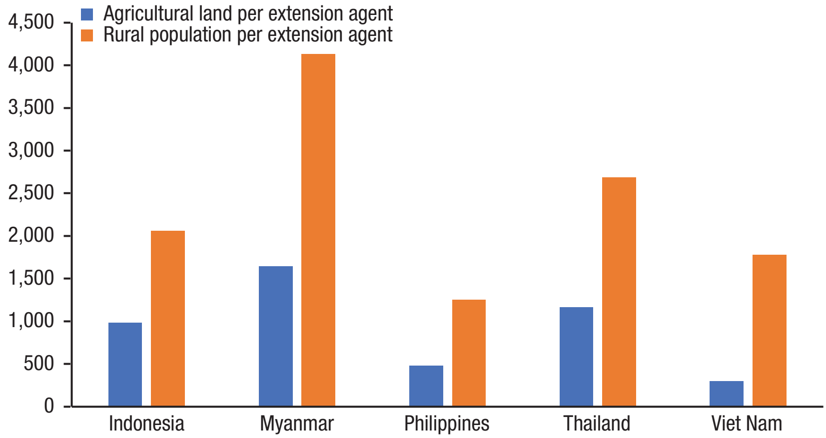
### HIGH TRANSACTION COSTS

Myanmar spends significantly less on the transport sector than other countries in the region (World Bank 2017b). More than 60 percent of highways and railways are in poor condition, and 40 percent of the rural population lacks access to all-season roads (World Bank 2024). Of this share of the rural population, 9.2 million people reside in approximately 25,000 villages that are not connected by any road, and another 20,000 villages—home to 11.3 million people—are connected by a road that is not accessible during all

4 In countries with thriving, modern agribusiness sectors, it is often the input vendors who extend varietal and other input information to farmers, or even the agro-processors—who purchase the final product from farmers—who instruct these producers on exactly which seed varieties, agrochemical packages, and cultivation calendars they expect farmers to employ.

5 The overall average for the region was 155.4 percent in 2019 (World Bank 2024).

**FIGURE 3.7** Extension agent coverage, Myanmar and neighboring countries




**Source:** Ekanayake, Ambrosio, and Jaffee (2019).

seasons (World Bank 2017b). Transport connectivity in Myanmar is still a major challenge that hampers agricultural performance. Moreover, some rural areas are also disconnected from markets because of conflict-related security issues. In these villages, costs are higher for inputs and mechanization services to raise productivity and for getting produce to market, resulting in lower farm incomes.

Regulatory obstacles compound the high costs resulting from poor physical infrastructure. The World Bank (2020) has developed an international standardized indicator on the ease of doing business, which measures regulation in 12 areas of business activity in a country. While Myanmar has improved its ranking over time, it still ranked low in 2020, at 165 out of 190 countries. Peer economies rank between 12 and 70. The Logistics Performance Index is a benchmarking tool that identifies "the challenges and opportunities countries face in their performance on trade logistics and what they can do to improve their performance (Arvis et al. 2018)." Using this measure, Myanmar scores significantly below its peer countries, as Table 3.10 shows. While peer countries rank between 26 and 44 on a list of 160 countries, Myanmar is far below at 137.

Difficulties related to international trade have enormous implications for the implicit and explicit costs of importing and exporting. Bouët and Laborde (2019) calculate the costs—implicit and explicit—of international

**TABLE 3.10** Ranks of ease of doing business and international trade and trade tariffs, Myanmar and neighboring countries

| Category | China | India | Malaysia | Myanmar | Thailand | Viet Nam |
|---|---|---|---|---|---|---|
| Rank on ease of doing business (out of 190 countries) | 31 | 63 | 12 | 165 | 21 | 70 |
| Rank on Logistics Performance Index (out of 160 countries) | 26 | 44 | 41 | 137 | 32 | 39 |
| Equivalent ad valorem tariffs exports (%) | 41 | 28 | 22 | 59 | 31 | 26 |
| Equivalent ad valorem tariffs imports (%) | 78 | 163 | 111 | 311 | 148 | 100 |

**Source:** Bouët and Laborde (2019); World Bank database (2020).

trade in agricultural goods for several countries.[6] For Myanmar, they find that the sum of these costs is equivalent to an ad valorem tariff for imports of 311 percent, significantly higher than for peer countries. On the export side, Myanmar's costs are equivalent to an ad valorem tariff of 59 percent, compared with 22 percent for Malaysia and 26 percent for Viet Nam (Table 3.10). Given complications with trade since the military coup, all these indicators have worsened.

This international comparison indicates that Myanmar ranks low on several indicators of access to infrastructure and service delivery, associated, as expected, with overall lower development and income levels. Myanmar is doing especially poorly on regulations and ease of doing business, ranking much lower than all its peer countries.

## Conclusions

Despite important initial steps between 2011 and 2019, tangible progress in Myanmar's agricultural transformation was slower than hoped. The impoverishment of farming communities during decades of socialist military rule, from the 1960s until the turn of the century, led to an outflux of migrants to neighboring countries. As the country opened up to foreign investment through economic reforms initiated in 2011, rural wages surged, and farm mechanization services expanded rapidly. Together with increased remittance flows from migrants, higher rural household incomes drove growth in a wide

6 These costs include (1) duties; (2) nontrade measures such as price and quantity control measures, antidumping measures, safeguards, sanitary and phytosanitary standards, technical barriers to trade, export measures, trade-related investment measures, distribution restrictions, restrictions on post-sale services, subsidies, and measures related to intellectual property rights and rules of origin; and (3) trading costs related to customs infrastructure, domestic transportation, communications infrastructure, credit, and insurance markets.

range of nonfarm service enterprises. Nevertheless, agricultural growth was low, and most crop subsectors stagnated as a result of underlying and unresolved structural constraints, such as poor infrastructure and inequality in land access.

The public sector has made progress in reallocating expenditure and modernizing its service delivery to farmers, but there is still a long way to go. Land access, land use restrictions, and uncertain tenure undermine smallholder growth. Farmers and small-scale agribusinesses have inadequate access to financial services. Decades of underinvestment in research and the diffusion of improved varieties, quality seed, and crop and livestock management techniques have left Myanmar's farmers behind their peers in the region. The trade policies of Myanmar's neighbors have created high price volatility for key crops such as pulses, rice, and maize, causing farmers to be more risk averse.

Myanmar's recent history—including its rural economic transformation and the effects of COVID-19 and the military coup in February 2021—provides important lessons for designing and implementing plans to help the country recover and advance. As in many other Asian countries, border closures and lockdowns instituted in early 2020 to prevent the spread of COVID-19 resulted in widespread losses to employment and income. The Myanmar government proactively sought to mitigate the impacts through expanded credit to farmers and businesses. By the end of 2020, Myanmar was beginning to recover from the economic stresses of COVID-19. However, the February 2021 military coup resulted in a far more severe economic downturn, which the collapse of the financial system, massive resignations by public sector employees, and prolonged movement restrictions compounded. The coup-induced state failure greatly magnified the health and economic consequences of COVID-19, namely the effects on poverty, food insecurity, and stalled economic transformation.

The economic consequences of COVID-19 and the military coup have revealed important weaknesses in Myanmar's agrifood system and its ability to support resilient rural livelihoods and national food and nutrition security. Agriculture's contribution to the economy and the welfare of farmers and consumers remains far below its potential. Despite recent setbacks, supporting the potential of Myanmar's agriculture sector to drive economic transformation, reduce poverty, and achieve food and nutrition security for all is a worthwhile goal, even in this crisis period.

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