



MYANMAR

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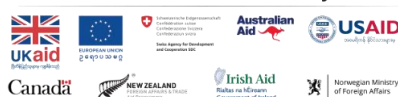
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Beyond emergency relief

What will it take to ensure a resilient recovery for agriculture and the rural economy of Myanmar



Livelihoods and Food Security Fund



managed by UNOPS

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ABSTRACT

The recent history of rural economic transformation in Myanmar and the effects of COVID-19 and the military coup in February 2021 provide important lessons for the design and implementation of plans to help the country recover from these scourges. The impoverishment of farming communities in Myanmar during decades of socialist military rule, beginning in 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 range of non-farm service enterprises. Nevertheless, agricultural growth was low and most crop subsectors stagnated due to underlying and unresolved structural constraints such as poor infrastructure and inequality in land access.

As in many other countries in Asia, border closures and lockdowns instituted to prevent the spread of COVID-19 in early 2020 resulted in widespread employment and income losses. The Myanmar government pro-actively 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 than COVID-19 due to the collapse of the financial system, the massive resignations by public sector employees, and the prolonged movement restrictions. Coup-induced state failure greatly magnified the health and economic consequences of COVID-19 in terms of poverty, food insecurity, and stalled economic transformation. This paper uses a combination of macro, meso, and micro-level analyses to measure the impacts of COVID-19 and state failure on rural economic transformation through the lens of the agri-food system, and to draw lessons for policies to support broad-based and resilient economic recovery.

1. INTRODUCTION

Agriculture and the related input supply, product processing, trade, and retail distribution activities that make up national food systems are a major driver of rural economic transformation in late-transforming countries. In addition to direct contributions to rural employment and GDP, agricultural and food system growth has high multiplier effects on the broader rural economy (Mellor 2017). In Myanmar, after almost five decades of narrowly prioritizing rice production and foreign exchange earnings, the government began to shift its policy focus in 2011 to promoting farmer welfare and rural development. A decade later, the COVID-19 pandemic has not only demonstrated the resilience and adaptability of Myanmar's agri-food system but also highlighted its structural vulnerabilities. The military coup in February 2021 greatly exacerbated the stress on the agri-food system, weakened state capacity to contain the third (and most deadly) wave of COVID-19, and resulted in a major humanitarian assistance crisis.

An understanding of the strengths and weaknesses of Myanmar's agri-food system and rural economic transformation process over the past decade, and particularly during the COVID-19 pandemic, is instructive for ensuring the resilience of recovery efforts in Myanmar as well as late transforming countries in Asia and other regions. To capture these lessons, our paper addresses the following questions:

- What were the drivers of, and constraints to, rural transformation in Myanmar over the decade preceding COVID-19?
- How did COVID-19 affect agri-food system participants and how were they able to adapt before and following the military coup in 2021?
- What are the expected consequences of coup-induced state failure during the COVID-19 pandemic for poverty and food insecurity?

We answer these questions using analyses based on three types of survey data, respectively: 1) rural livelihood surveys undertaken in each of the main agro-ecological zones of Myanmar between 2015 and 2019; 2) panel phone surveys of different agri-food system actors during COVID-19 before and following the February 2021 coup; and 3) micro-simulation of the effects of the coup on poverty and food security for different types of households using nationally representative household expenditure data collected in 2015. The organization of the paper follows the sequence of questions above, with additional information on data sources and methods provided in each section. We conclude with implications for the types and sequencing of policies to enable sustainable and inclusive rural economic recovery from the combined COVID-19 and military coup shocks.

2. MYANMAR'S RURAL ECONOMIC TRANSFORMATION IN THE DECADE BEFORE COVID-19: UNEVEN PROGRESS

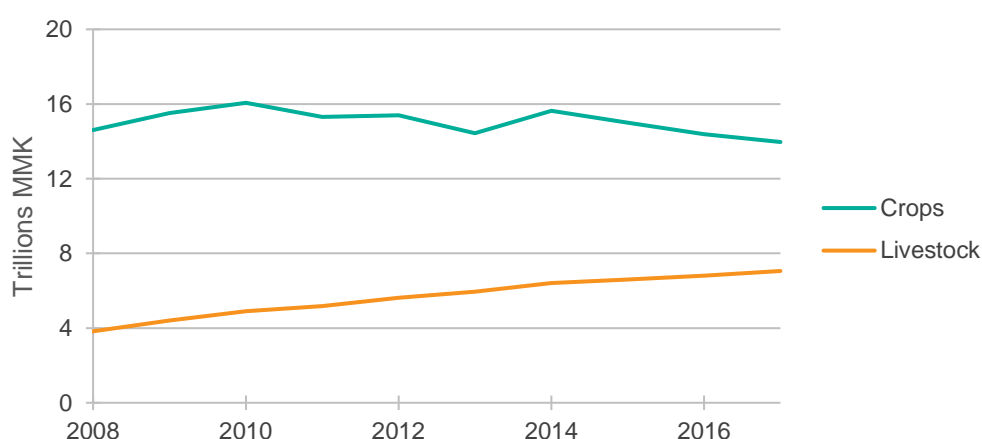
Rural economic transformation is essential to Myanmar's development as 70 percent of the population, and 87 percent of the country's poor, live in rural areas (World Bank 2017). Agriculture and its associated agro-industries are a key sector of the rural and national economy, employing half of the total labor force and contributing one-third of the national GDP—about 23 percent directly in farm incomes and another 11 percent in agro-processing, distribution, trade, agricultural export businesses and food retailing. Ekanayake et al. (2019) estimate that nearly half of Myanmar's poverty reduction between 2005 and 2015 is attributable directly to progress in agriculture. We first consider efforts to promote rural economic growth and the extent of observed change, and then identify structural rigidities holding back transformation.

2.1 Reform efforts in support of agricultural and rural economic transformation

The decade prior to COVID-19 saw two successive governments attempt to invigorate agricultural growth and rural economic transformation. 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. The MOAI and MLFRD were 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 benefitted 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 (Ministry of Labour, Immigration and Population 2015, 2020).

Despite apparently strong domestic political support for agriculture, overall sector growth was slow and the major drivers of change during the period 2011-2020 had little to do with public sector initiatives. Agricultural GDP grew at just 0.5 percent per year in the five-year period 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 1). Crop production, in contrast, fell by 1.4 percent per year, reflecting stagnant yields and declining area cultivated for some labor-intensive industrial crops (e.g., cotton). Maize production was an exception to the trend, expanding rapidly in response to demand for livestock feed and the availability of more profitable hybrid varieties.

Figure 1. Trends in agricultural sector GDP, in trillions MMK



Source: Authors' calculations based on data from the Ministry of Planning, Finance and Industry, Myanmar

Data from rural household livelihood surveys undertaken in each of the four main agro-ecological zones of Myanmar over the period 2015-2019¹ found evidence of accelerating migration out of rural

¹ Belton et al. (2021a) provide details of agro-ecological zone locations, sampling method, and questionnaire modules. Data for each of the surveys can be accessed at <https://dataverse.harvard.edu> using the search term Food Security Policy Project Myanmar.

areas (Filipski et al. 2021), rising daily labor wages (Belton et al. 2021a), and an agricultural mechanization revolution fomented largely by the private sector (Win et al. 2018). Increasing scarcity and higher cost of wages for hired labor, together with improved timeliness of operations and ability to manage weather risks, provided farmers with strong incentives to adopt mechanized land preparation and harvesting. 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 SME mechanization service providers (Belton et al. 2021b).

While the expansion of mechanization services was very helpful in enabling farmers to adapt to growing labor shortages, access to land for farming in Myanmar remains highly skewed. More than half of rural households have no access to farmland. This reflects a long history of dispossession, whether due to bankruptcy brought on by the government paddy quota system or land confiscation by the government. Even among landed households there is a high degree of inequality in landownership. Just over 5 million households, representing 70 percent of the country's total of 7.2 million farm households, cultivated 2 acres each on average in 2018-2019. In the central Dry Zone, the bottom third of landowning households (tercile 1) have rights to a mere 4 percent of all cultivable farmland, while the third of landowners with the largest holdings (tercile 3) have rights to 20 times the share of the bottom tercile (Belton et al. 2021). The distribution is similar in the Delta where tercile 1 has access to just 3 percent of cultivable agricultural land while tercile 3 can access 69 percent. 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.

Given inequalities in land access, rural economic transformation off the farm over the past decade has been an important complement to farm labor as an income source for landless and small farm households. Belton et al. (2021a) report that between 16 percent and 29 percent of rural households operate non-farm enterprises. Transport enterprises have grown fastest, followed by retail, prepared food and person services such as beauty salons. Unlike agriculture, however, few non-farm enterprises generate wage employment outside the family.

2.2 Underlying constraints to agricultural and rural economic transformation

The constraints to rural economic transformation posed by inequitable land distribution and rigid land use regulations discussed above are compounded by low farm productivity, limited access to finance for seasonal input purchase, high transport costs, and unpredictable markets. We briefly discuss each of these constraints below.

2.2.1 Low farm productivity

Investments in agricultural research are central to improved agricultural performance over time. Myanmar's low yields compared to other countries in the region—30 percent below regional peers for paddy and maize, and 50 percent for oilseeds—are partly a reflection of very limited research investment and human capacity. Table 1 shows that Myanmar spends less than one-tenth of 1 percent of its agricultural GDP on agricultural research. Thailand spends 16 times as much. The second lowest spender on agricultural research in the region—Viet Nam—spends three times as much on agricultural research compared to Myanmar. Even if we look at other metrics such as expenditures per capita or expenditures per rural resident, these numbers are extremely low. Myanmar has very few aquaculture/fisheries researchers and no livestock researchers other than faculty at the Veterinary University. The low investment in agricultural research is compounded by weak extension linkages which translate into low rates of varietal adoption (Boughton et al 2020).

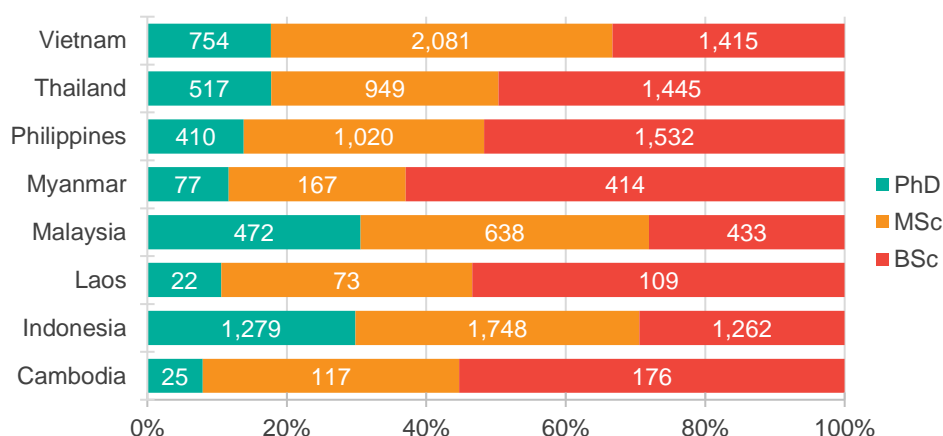
Table 1. Investments in agricultural research

	Research spending in 2017			
	Million USD*	% of ag. GDP	USD/cap.*	USD/rural cap.*
India	4171.8	0.30	3.12	4.69
Malaysia	629.0	0.85	19.89	81.00
Myanmar	46.6	0.06	0.87	1.25
Thailand	847.2	0.94	12.27	24.16
Viet Nam	177.6	0.20	1.86	2.87
Bangladesh	287.9	0.38	1.75	2.73

Note: *2011 values.

Source: ASTI database (<https://www.asti.cgiar.org/data>)

Figure 2 further shows the small number of agricultural researchers and the relatively low proportion of MSc and PhD degree holders in Myanmar's agricultural research system.

Figure 2. Agricultural researchers by degree, 2017

Source: Stads et al. (2020)

Stads et al. (2020) assess to what extent the agricultural sector in Southeast Asia would benefit from increased expenditures in agricultural research overall. Their analysis of a closing-the-gap scenario—under which growth in agricultural research investments are set at rates that will gradually close the investment gap by 2030 and then maintain this level until 2050²—indicates that Myanmar's annual productivity growth could reach as high as 7.7 percent under this scenario.

2.2.2 Access to rural finance

Lack of access to finance was the single biggest constraint faced by agri-food system actors during COVID-19. Prior to the February 2021 coup, more than 70 percent of the population lacked access to formal finance and the underdeveloped finance sector did not 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 in the East Asia and the Pacific.³ Moreover, while the agri-food 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 rapidly expanded their services in recent years, but many farmers remain unserved or underserved (Basu et al. 2020). A substantial share of farmers, traders, and other agri-businesses therefore rely on informal markets

² This implies a ten-fold increase in R&D investments from about 47 million annually in 2017 (0.06 percent Ag. GDP) to about 470 million USD in 2030 and the years after (0.61 percent of Ag. GDP, called the attainable investment level). Stads et al. (2020) developed "attainable" investment targets for each of the countries based on the size of their agricultural sector and total economy, their income level, and the availability of relevant technology spillovers from other countries.

³ The overall average for the region was 155.4 percent in 2019 (World Development Indicators, data.worldbank.org).

that charge high interest rates. At the farm level, the limited access to and the high cost of finance can limit the adoption of improved agricultural inputs, high-value crops, and improved quality and safety practices by farmers. Downstream actors similarly face reduced incentives to invest in efficient marketing, processing, and storage.

2.2.3 High transport and transaction costs in agricultural value chains

Myanmar spends significantly less on the transport sector than other countries in the region (ADB 2017). Over 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 2020). Twenty-five thousand villages and 9.2 million people are residing in villages not connected by any road and another 20,000 villages and 11.3 million people are connected by a road that is not all-season (ADB 2017). Transport connectivity in Myanmar is therefore still a major challenge for a large part of its rural population and hampers agricultural performance. Moreover, part of the rural population is also largely disconnected from markets because of conflict-related insecurity issues. In these villages, inputs and mechanization services to raise productivity cost more (or may be less timely) and produce costs more to get to market, resulting in lower farm incomes.

The high costs for businesses due to poor physical infrastructure are compounded by regulatory obstacles. According to the World Bank's 'Enabling Business of Agriculture' score⁴, regulatory measures are prohibitive in allowing private agri-businesses to flourish in Myanmar. In 2019, Myanmar ranked 91st out of the 101 countries where the assessment was conducted, more than 20 places behind the lowest ranked Asian peer country, Malaysia (World Bank 2019).

2.2.4 High market volatility in agricultural export commodities

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 in the past, with both export quantities and prices subject to rapid spikes and abrupt falls. Quotas have abruptly reduced pulse exports to India and maize import bans limited exports to China, while international price volatility has led to wide swings in many commodity prices, including rubber, pulses, and maize. Compounding these problems, the generally low productivity of Myanmar's farmers and limited value-added processing hamper competitiveness and confines Myanmar exporters to low prices in often volatile international markets. Transmitted to the farm level, such price characteristics do not encourage investment by farmers in either quality or productivity.

Having considered the recent progress and underlying constraints to Myanmar's agricultural and rural economic transformation, we now turn to how the agri-food system weathered the COVID-19 pandemic.

3. MYANMAR'S AGRI-FOOD SYSTEM PERFORMANCE WITH COVID-19: WEATHERING THE STORM

Myanmar has experienced four waves of COVID-19 to date—in April 2020, September 2020, July 2021 (Delta variant), and December 2021 (Omicron variant). Apart from the most recent wave, lockdowns were ordered to reduce disease spread. The July 2021 wave was the most severe in terms of disease incidence and mortality, aggravated by the collapse of the public health system following the February 2021 coup and shortages of oxygen. The first wave occurred just as farmers, input suppliers, and mechanization service providers were beginning to prepare for the main 2019

⁴ To develop this indicator, the World Bank assessed regulations in eight sectors in agriculture, including supplying seed, registering fertilizer, securing water, registering machinery, sustaining livestock, protecting plant health, trading food, and accessing finance (World Bank 2019).

agricultural season, the monsoon season. The second and third waves occurred at the mid-point of the 2020 and 2021 monsoon seasons respectively.

Even though the second and third waves of COVID-19 had similar timing in relation to the agricultural calendar, the nature of the challenges facing the agri-food system were very different. In 2020, shocks to the agri-food system were generally transient in nature, related to movement restrictions to prevent disease spread and financial liquidity constraints faced by different actors. The government was very responsive to difficulties faced by the sector, expanding access to credit under the COVID-19 economic recovery plan. By December 2020 the economy was on a recovery track. Following the February 2021 coup, however, the financial system was severely disrupted by the closure of bank branches and the internet shut down which together prevented financial transfers. A rapid depreciation of the Myanmar Kyat (MMK) and higher fuel prices led to rapid increases in transport costs and mechanization services, as well as the cost of imported fertilizer, compounding the effects of higher international shipping costs due to global shipping container shortages. As a result, the third wave of COVID-19 occurred at the mid-point of an agricultural season when agri-food system actors were facing prolonged rather than transient shocks.

3.1 Response of the agri-food system to COVID-19 shocks pre-coup

Beginning in March 2020, transportation restrictions to curb the spread of COVID-19 caused significant disruptions throughout Myanmar's food supply chain. Transportation restrictions during the first wave, often implemented at 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 the areas they serviced (Boughton et al. 2021). Importantly, both sectors recovered quickly through a combination of business adaptations and less rigorous enforcement of travel restrictions over time. Monsoon crop production declined in some areas, partly due to irregular rainfall and pests, but, in aggregate, there were no clear signs of severe production declines for important crops. National production estimates for rice and pulses declined by less than 4 percent in 2020 compared to 2019 and maize increased by 2 percent (USDA 2021).

Although COVID-19 policy responses had a minimal effect on production there were widespread disruptions in crop trading. Farmers faced challenges in marketing their harvests as crop traders had to contend with closed commodity exchange centers and border crossings. However, the supply chains once again adjusted 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 violating curfews. Additionally, border gates temporarily reopened to exports, particularly for rice and maize. Ultimately, the prices of main commodities remained mostly stable during the 2020 monsoon harvest period and without severe disruptions relative to previous years. Rice prices increased by 2 percent on average relative to 2019, while farmers benefited from a 5 percent average increase in prices for their monsoon paddy (MAPSA 2021a). Lockdowns in urban areas were accompanied by only a modest increase of 3 percent in food prices for traditional food retailers in Yangon and Mandalay (Goeb et al. 2021). Rural food vendors also reported relatively small changes in food prices over that period (Oo et al. 2020).

One of the more persistent impacts of COVID-19 was 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 reported planning to offer less credit in the future.

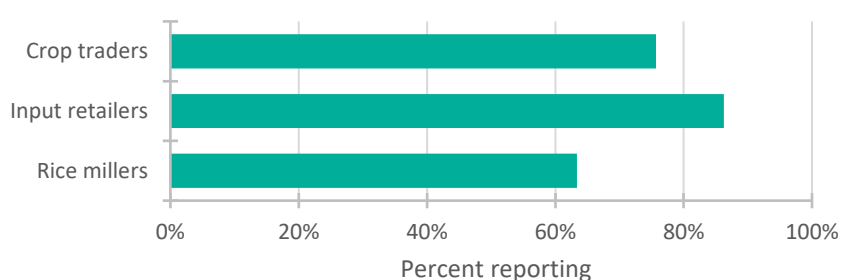
Although the impacts of COVID-19 policies did not have seismic effects on food prices or availability, they were a harbinger for the disruptions caused by the coup. During the most stringent lockdowns that accompanied the first two waves of COVID-19, disruptions were large and

widespread. However, agri-food system actors were able to adapt because restrictions were lifted, marketing continued, and key services like banking and mobile internet were uninterrupted. However, in the absence of these key services following the coup, food system actors clearly faced a different set of challenges.

3.2 Response of the agri-food system to post-coup shocks

Shocks to the agri-food system since the February 2021 coup were larger and longer lasting than those posed by the first two waves of COVID-19. Curfews, safety concerns and rising fuel costs following the coup led to even larger transportation disruptions than COVID-19 lockdowns. Phone surveys were conducted with crop traders, agricultural input retailers, and rice millers in March and April 2021.⁵ 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 of their state or region (Figure 3).

Figure 3. Agri-food system firms reporting increased transportation costs since February 1



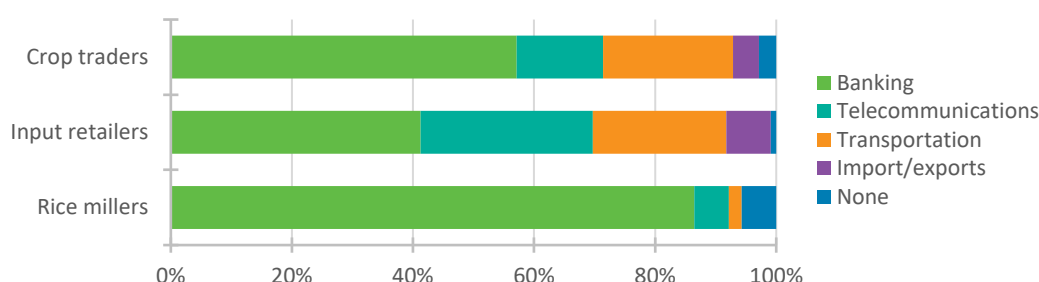
Sources: Agricultural commodity traders survey–March 2021 round (MAPSA 2021b); Input retailers survey–March 2021 round (MAPSA 2021c); Rice millers survey–April 2021 round (MAPSA 2021d).

Increased transportation costs drive a widening wedge between farmgate prices and consumer prices. Survey data from rice millers show lower prices paid to farmers for their summer paddy compared to 2020, while a survey of food vendors shows rice prices have risen by 11 percent over a similar period. Pulse prices increased in May 2021, largely due to India's removal of import quotas. Yet, farmers are unlikely to have benefited from price gains as the main harvest period occurred three months earlier. Further, the coup removed several of the adaptation tools that traders used to maintain their business activities during COVID-19; cellphone and internet shutdowns made it difficult to find prices and market information as well as initiate mobile bank transfers.

The challenges to transportation and internet communications affected every level of the agri-food system from farmers to consumers. However, banking sector disruptions were the most impactful for 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 since February 1 (Figure 4). Without access to in-person banking services or internet for mobile transfers, agricultural trade must be heavily reliant on cash. Even when businesses can access a branch, daily and weekly cash withdrawal limits pose a significant challenge. Crop marketing firms therefore have less working capital available compared to the same time last year and have had to reduce their purchase volumes. Similar effects are seen at the farm level, where farmers have less cash available and lower incomes which, along with sharp increases in input costs and a large decline in credit available, lead to reduced investment in production inputs.

⁵ The crop traders survey was conducted March 2021 with 108 traders from Shan, Mandalay, Magway and Sagaing regions. The input retailers survey was conducted in March 2021 with 146 shops in Shan, Ayeyarwady, Bago, Mandalay, and Kachin. The rice millers survey was conducted in April 2021 with 221 millers in Ayeyarwady, Yangon, and Bago.

Figure 4. Most important business disruption since February 1, share of respondents



Sources: Agricultural commodity traders survey–March 2021 round (MAPSA 2021b); Input retailers survey–March 2021 round (MAPSA 2021c); Rice millers survey–April 2021 round (MAPSA 2021d).

Input markets were clearly disrupted as farmers prepared for the 2021 monsoon season. Access to timely credit is important for farmers to acquire inputs. The Myanmar Agricultural Development Bank (MADB) is typically a major provider of agricultural credit, especially for rice producing areas (almost \$1 billion in monsoon loans were issued by MADB from May to September 2020 in addition to the MMK 300 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 appears to have been substantially less than normal. While the portfolio of most microfinance institutions (MFIs) is typically less geared towards agriculture, their reduced activities– linked to lack of liquidity (due to low collection and saving rates) and constraints due to withdrawal limits– also hampered credit availability for the agricultural sector and the rural sector more broadly.

Agricultural businesses are typically also important providers of credit to farmers and there has been a large increase in demand for credit to farmers ahead of the 2021 monsoon season. Between 40 percent and 50 percent of crop traders, input retailers, and rice millers each reported a significant increase in requests for credit (Table 2). However, between 56 percent and 66 percent of these firms are experiencing difficulties and delays in collecting repayments from farmers on credit already lent out.

Table 2. Farmer credit overview for agribusinesses, by percentage of respondents

	Crop traders (%)	Input retailers (%)	Rice millers (%)
Increased demand from farmers for credit	40	50	48
Difficulties collecting credit repayments	56	66	60
Expect to be fully repaid (conditional on credit out)	76	74	-
Expected change in credit offered to farmers in 2021 monsoon season			
Decrease in credit offered	27	34	-
No change	69	64	-
Increase in credit offered	4	3	-

Sources: Agricultural commodity traders survey–March 2021 round (MAPSA 2021b); Input retailers survey–March 2021 round (MAPSA 2021c); Rice millers survey–April 2021 round (MAPSA 2021d).

International inorganic fertilizer prices and shipping costs substantially increased in 2021 compared to a year earlier, which resulted in significantly higher border prices for fertilizer in Myanmar. The impacts of the current political crisis on the local transport sector and the depreciation of the Myanmar currency have further increased domestic fertilizer prices. Based on a survey of agro-retailers in June 2021, fertilizer prices were estimated to be 52 percent and 29 percent higher for urea and compound fertilizer, respectively, compared to the same period a year earlier. By September these increases had rocketed to 132 percent and 76 percent for urea and compound,

respectively. In response, farmers purchased 38 percent less urea and 42 percent less compound fertilizer (MAPSA 2021e). This is an important development as fertilizers are the largest purchased input for Myanmar farmers, constituting 30 percent of all inputs purchased. Furthermore, prices charged for land preparation were significantly higher in 2021 than 2020 (an approximate increase of 25 percent).

On the output market side, we see that while retail food prices are up for many commodities⁶, farm prices were largely down in the months immediately following the February 1 military coup. As reported in Table 3, wholesale prices collected in May in major urban wholesale markets—an indication of farm level changes—show that prices of most domestically consumed agricultural products were down compared to last year while prices of agricultural products linked to export markets (e.g., rice, maize, pulses) have been mostly stable or slightly increased and prices of agricultural products linked to imports (e.g., vegetable oils) have increased significantly (linked to international trends for these prices).

Table 3. Wholesale prices for select agricultural commodities in Mandalay and Yangon in May 2020 and May 2021, MMK/kg

	May 2020	May 2021	Change (%)
Mandalay			
Maize	285	327	+14.7
Mung bean	1281	1136	-11.3
Palm oil	1000	2166	+116.6
Pigeon pea	717	863	+20.4
Yangon			
Maize	310	341	+10.0
Rice	577	612	+6.0
Onion	322	246	-23.7
Potato	325	237	+27.1

Note: Prices for palm oil and chili in April 2021 are based on less than ten observations.
Source: Impact Terra

The combination of higher input prices for mechanization, fertilizers, and agro-chemicals, and a mixed picture for farm output prices, suggest that farmers have less incentive to invest in inputs. Ex-ante simulations of the impact on inorganic fertilizer use, which assume a ratio of additional crop output per unit of fertilizer applied between three and five, indicate that a reduction in fertilizer use—all else equal—to half the level of a normal year would reduce agricultural output in 2021 by between 9 and 15 percent (MAPSA 2021f). This prediction is consistent with the findings of a survey of rice millers in November 2021 that mill throughput was down 11 percent from a year earlier (MAPSA 2022).

In sum, the prolonged shocks affecting the agri-food system in 2021 following the military coup mean that agriculture is less able to support the rural economy compared to 2020. We turn next to an analysis of the implications of Myanmar's stalled rural economic transformation in the broader context of national poverty and food insecurity projections.

⁶ Compared to almost a year ago (June 2020), food price inflation in May 2021 stood at 7 percent at the national level. It was relatively higher in the Dry Zone (10 percent) and the Hills and Mountains (7 percent). The poorest quintile is affected as much by food price inflation as the richest quintile. Most of the food price inflation over the last year occurred in the first months of 2021: The cost of an average food basket in May 2021 was 9 percent higher than in December 2020.

4. POVERTY AND FOOD INSECURITY IN THE PRESENCE OF COUP INDUCED STATE FAILURE: HITTING THE ROCKS

Prior to the February 1 military intervention, Myanmar's economy was on a recovery track, albeit a slow one. Whereas the COVID-19 induced crisis primarily affected the real economy through a combination of external and internal shocks, especially the April and August lockdowns, the sharp and prolonged downturn of economic activity since February 1 has been driven in large part by systemic financial system failures.

4.1 Expected impact on poverty of COVID-19 combined with the coup

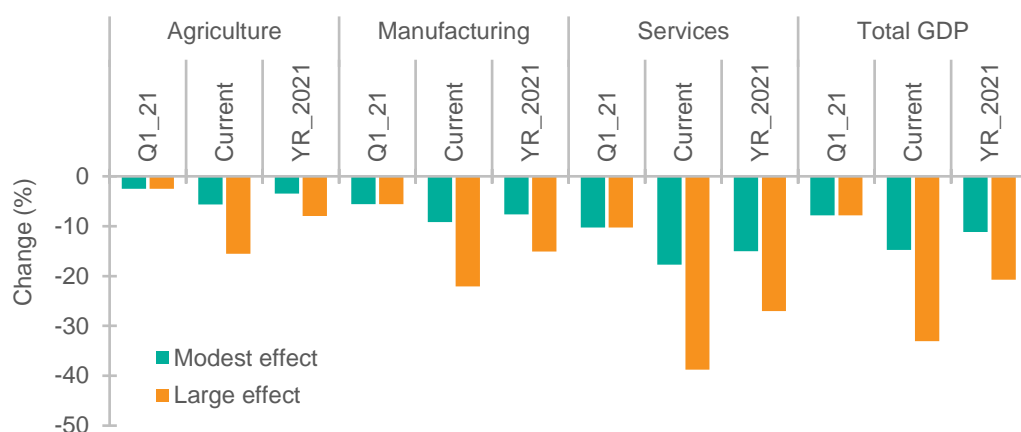
The macro-economic analysis is based on an extension of the Social Accounting Matrix (SAM) simulation conducted by Diao et al. in 2020 to assess the impacts of COVID-19 on Myanmar's economy (Diao et al. 2020). Due to uncertainty about the actual effects of disruption on the economy, the updated analysis includes two scenarios. In the "modest effect" scenario, imposed shocks are equivalent to 35 percent of the shock used for the April 2020 COVID-19 lockdown given the similarity in the patterns in Google mobility data following the two events.⁷ Under the "large effect" scenario, imposed shocks are equivalent to 70 percent of the shock imposed during the COVID-19 lockdown to reflect additional impacts on the economy due to financial system dysfunction. Because of the linkage effects in the model, doubling the shocks causes more than double the reduction in GDP. The actual impact is expected to be somewhere between these two levels of shocks, but closer to the large effect scenario the longer the economic disruption continues.

The predicted effect of the two levels of shock on total GDP and the relative impacts on broad sectors are depicted in Figure 5. Due to intra-annual seasonality in Myanmar GDP formation, percentage changes should be understood as a comparison with a normal situation in the same period and not as changes relative to an earlier quarter. Period Q1_21 represents the first quarter of the Myanmar fiscal year, October to December 2020, at which time the economy was recovering from COVID-19. The "Current" period represents Q3 (May to July 2021), with total GDP expected to be between 14.8 percent and 33.1 percent lower than normal. The overall impact for the financial year is predicted to be a reduction in GDP of between 11.2 percent and 20.7 percent. The July 2021 estimate by the World Bank of an 18 percent drop in GDP for the 2021 financial year is close to the "large effect" we predict.⁸ At the sectoral level, services are expected to be impacted most severely, followed by manufacturing. Agriculture is the least severely affected sector. However, any reduction in agricultural GDP is important from a welfare perspective because of the high proportion of the rural poor whose livelihoods depend on the sector directly or indirectly.

⁷ Google mobility data have been shown to be good predictors of economic activity (Headey et al. 2021)

⁸ <https://www.worldbank.org/en/country/myanmar/publication/myanmar-economic-monitor-july-2021-progress-threatened-resilience-tested>

Figure 5. SAM multiplier analysis of impacts on GDP during fiscal year 2021

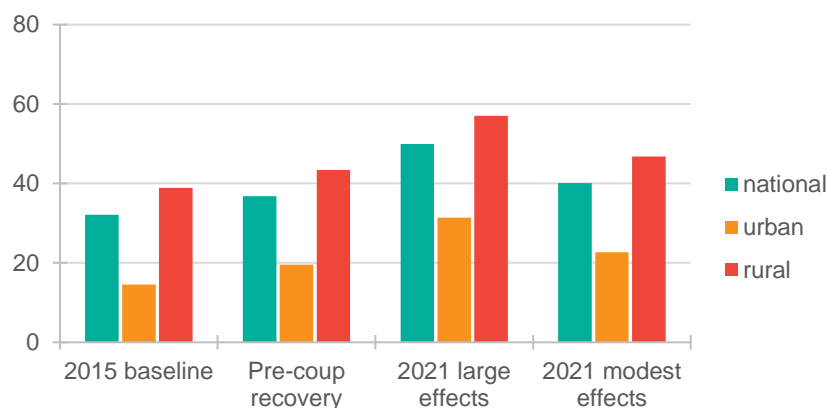


Source: Authors' calculations

Results from the SAM multiplier analysis are used as an input to an analysis of household-level impacts using the Myanmar Poverty and Living Conditions Survey (MPLCS) 2015 data set. This allows us to predict the impact of changes in the economy on rates of poverty and food insecurity for different groups of households, such as urban versus rural households, vulnerable households, as well as households in different geographical zones, relative to 2015. As in the case of the SAM analysis, the micro-simulation analysis is an extension of the analysis of household level impacts for COVID-19 (Diao et al. 2020). Details on the effects of modest and large economic disruption scenarios on different household income sources are provided in Appendix Table A.1.

The economic consequences following the military intervention are predicted to result in poverty rates between 40 percent and 50 percent compared to 32 percent in 2015, which is the survey baseline year (Figure 6). Although urban poverty rates are predicted to increase proportionately more than rural poverty rates, doubling relative to 2015 under the “large effect” scenario, rural poverty rates are still much higher than urban poverty rates. Between 849,000 and 1.87 million additional households are expected to be in poverty in 2021 compared to 2015, with three out of every four newly poor households located in rural areas. It is important to note that it is not only the total number of households in poverty that has increased but also the depth of poverty for households that were already poor. The poverty line expenditure shortfall is predicted to have increased from 26 percent in 2015 to between 34 percent and 40 percent on average for individuals living in poor households by the end of the current financial year. This has important implications for the consequences of poverty, particularly in terms of food insecurity, which we discuss in more detail in the next section.

Figure 6: Percentage of urban and rural households below the poverty line

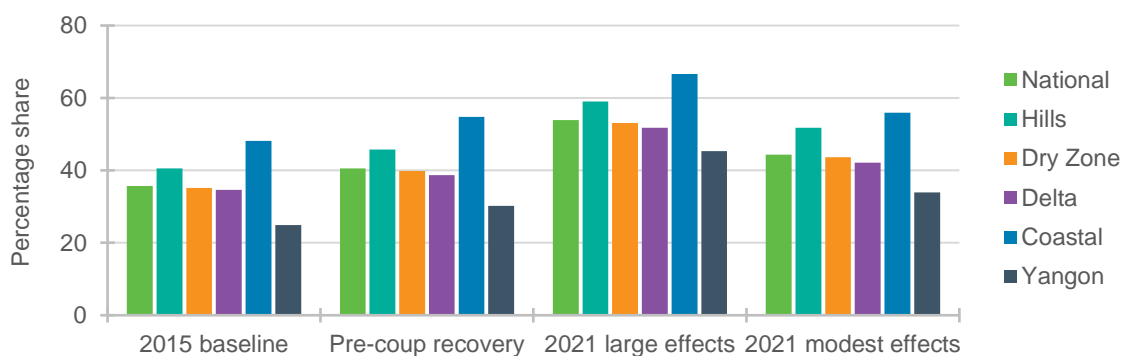


Source: Authors' calculations

4.2 Expected impact on food security of COVID-19 combined with the coup

The share of the population unable to purchase a recommended diet based on local food availability closely mirrors the share in poverty under each scenario (Figure 7).⁹ The share of individuals living in households that are unable to afford a recommended diet is noticeably higher relative to poverty rates in Yangon, reflecting higher non-food expenditure shares in urban household budgets as well as higher costs for some foods. Households which depend on remittances as an income source have also found themselves unable to afford an adequate diet as private remittance transfers cannot be accessed through the banking system at present (a constraint accounted for in the simulation).

Figure 7: Percentage of individuals living in households unable to afford a recommended diet by region/zone



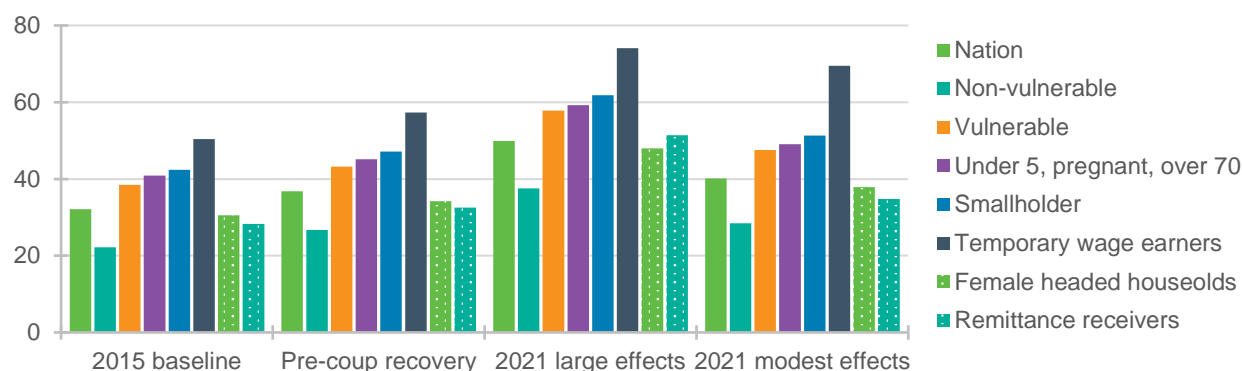
State and Region composition of zones is as follows. 1) Hills: Chin, Kachin, Shan, Kayin, Kayah; 2) Dry Zone: Magway, Sagaing, Mandalay; 3) Delta: Ayeyawaddy, Bago; 4) Coastal: Rakhine, Mon, Taninthari
Source: Authors' calculations

For targeting purposes, vulnerable groups can be defined based on a) their likelihood of becoming poor and b) the risk of prolonged or irreversible consequences if they do. We identified the following household types as potentially vulnerable based on these criteria: 1) households with children under five years of age or pregnant women, or households comprised solely of adults over 70; 2) smallholder farmers; 3) temporary wage earners; 4) female-headed households; and 5) remittance receivers. Figure 8 compares the predicted poverty rates between household groups hypothesized to be non-vulnerable and vulnerable. The analysis reveals that while all vulnerable groups are predicted to have higher poverty rates than non-vulnerable groups, certain vulnerable household types are more likely to become poor (or become more impoverished if already poor). These include those with young children, pregnant women, or elderly residents, and those with smallholder farmers or temporary wage earners. They are also likely to incur long-term consequences as households with young children or pregnant women face the threat of permanent loss of human capital through diminished learning potential¹⁰. Smallholder farmers may not be able to afford inputs, hired labor, or mechanization services to manage their crops, potentially leading to financial loss and, if unable to repay debts, having to sell their land rights. Temporary wage earners may lose the ability to work productively even when opportunities become available again. Some vulnerable households belong to multiple categories and hence face an even higher likelihood of falling into poverty or experiencing deeper poverty and enduring consequences.

⁹ For a detailed explanation of the composition and cost of a recommended diet in locations in Myanmar see Mahrt et al. (2019).

¹⁰ We include under-five years of age rather than under two-years of age (a common threshold for the first 1000 days of life) because important cognitive development is still taking place and under-five children are clearly vulnerable to the emotional and psychological toll of living in a food insecure family.

Figure 8. Predicted poverty rates for different household groups, by percentage share



Source: Authors' calculations

In addition to the poverty line we have been using in the analysis thus far, which considers household expenditure on food and non-food items, we now also include a food poverty line criterion. This is the cost of a calorie adequate diet based on consumption patterns of households with total expenditures near the poverty line. A household that falls below the food poverty line is unable to meet minimal food expenditures even if all their expenditure were to be directed towards food and nothing else. For comparison purposes, adjusted to 2020 prices, the poverty line is 1,779 MMK per capita and the food poverty line 1,154 MMK per capita per day.

Table 4 provides estimates of the number of households in groups we identified as vulnerable and with expenditure below each of the two poverty lines under large and modest economic disruption assumptions. Households with children under five and/or pregnant women are the largest type of vulnerable household, accounting for between two-thirds and 73 percent of the total (the share is higher using the food poverty line criterion compared to the total poverty line). Smallholder households are the second largest type and account for half the total number of vulnerable households. There is considerable overlap between these two categories as between 45 percent and 55 percent of vulnerable smallholder households have children under five and/or pregnant women. Daily wage and/or remittance dependent households account for between 16 percent to 18 percent of the total and between 45 percent and 55 percent of these households have children under five and/or pregnant women.

Table 4. Predicted number of vulnerable households for different poverty lines and economic impact assumptions

Target group	Total poverty line		Food poverty line	
	Large	Modest	Large	Modest
All vulnerable	3,198,497	2,590,463	1,183,396	883,802
Under 5 or pregnant	2,104,630	1,726,271	826,648	643,630
Smallholder	1,566,931	1,267,446	592,084	448,658
Daily wage or remittance	509,077	472,648	199,512	154,883
U5 & smallholder	703,676	597,869	302,778	244,828
U5 & daily wage	231,038	223,689	107,520	88,489

Source: Authors' calculations

Note: mean household size=4.6 persons

5. IMPLICATIONS FOR MYANMAR'S RURAL ECONOMIC TRANSFORMATION: FROM RELIEF TO RESILIENT RECOVERY

The coup-induced state failure in Myanmar has imposed a tragic toll far beyond the communities directly affected by conflict due to the unconstrained spread of the COVID-19 Delta variant following the collapse of public health services and to a deep economic downturn aggravated by the collapse of the financial system. Even the agri-food system, traditionally a shock absorber for the rural economy, has shown signs of buckling due to rapidly rising fuel, transportation, and fertilizer costs. Agricultural production and rural incomes are likely to be significantly lower post-coup. Putting Myanmar's rural economy back on an inclusive and sustainable transformation path will of course require a solution to the current political crisis. In the very short run, emergency assistance to small farmers and vulnerable families is essential to minimize permanent loss of health and human capital, and to preserve the productive assets necessary to maintain smallholder farming and SMEs. In the medium term, key institutions and policies need to be put in place to ensure that rural transformation is broad-based and sustainable. Specific recommendations for each phase follow.

5.1 Short-term relief measures

The poverty and food insecurity situation in Myanmar is dire and there is an urgent need to expand food assistance. In addition to the more than half million internally displaced people dependent on assistance for daily survival, the compounded effects of the COVID-19 pandemic and the political disruption in the country are predicted to leave between 40 percent and 50 percent of the population in poverty.

Most of Myanmar's poor are in rural areas. While the increase in poverty rates following the February 1 coup has been proportionately higher in urban areas, the rural areas experienced higher poverty rates and account for a much larger share of the population. It is estimated that 47 percent and 23 percent of the rural and urban population, respectively, are poor under the modest impact scenario. This share increases to 57 percent and 31 percent, respectively, under the (more likely) large impact scenario. Under the latter scenario, there would be five times as many poor in rural areas compared to urban ones (4.0 million poor households in rural areas and 0.8 million in urban areas).

In this context, short-term food assistance is essential to enable vulnerable poor households to avoid excruciating hunger and irreversible financial or health consequences. In-kind food assistance is logistically complex but more feasible than cash transfers given lack of access to cash through the banking system. The paper has identified key vulnerable groups among the poor who should be targeted with food assistance (e.g., households with children under five and/or pregnant women, smallholder farmers, and daily wage dependent households).

Assuring an adequate monsoon harvest and enabling farmers to prepare for a successful post-monsoon season is necessary to overcome food insecurity. Reduced farmer incomes last year (due to COVID-19 challenges), rising prices of all agricultural inputs in recent months, expected lower credit availability this season, and more uncertain agricultural profitability all indicate that there will be reduced investments by farmers and that agricultural output from the monsoon season will be lower this year than normal. Ensuring that mechanized combine harvesting service providers can reach farmers and that farmers can afford their services will help reduce the risk of post-harvest losses and facilitate timely planting of post-monsoon pulses dependent on residual soil moisture. Existing credit access constraints should be resolved ahead of the post-monsoon season and repayment of the MADB COVID-19 special loans should be waived. Making sure that trade

opportunities are not subject to export restrictions will also help to assure adequate prices for farmers.

5.2 Medium-term recovery measures

In the medium term, policy reforms are needed to resolve the major underlying constraints to rural economic transformation in Myanmar. These include inequality in land access and tenure security, limited access to financial services, poor market access and infrastructure, and low agricultural productivity and export market competitiveness.

5.2.1 Land access and tenure security

Currently, 51 percent of all rural households hold no land use-rights. Even among the remaining 49 percent of rural households with use-rights to agricultural land, access remains highly skewed, with the top 2 percent of households controlling one-quarter of all farmland. In addition to highly skewed access to land, many farmers operate under highly insecure tenure arrangements and with limited flexibility to allocate land to its most lucrative potential use. Land policy reforms are needed to address each of these issues.

The one-half of rural households that have access to an acre or more of farmland require secure recognition of their use-rights if they are to invest in productivity enhancing investments on their farmland. Yet even long-term use under customary, virgin, or traditional lands is currently only weakly recognized in many locations, leaving farmers vulnerable to administrative evictions.

The fastest growing, highest value agricultural opportunities in Myanmar—including aquaculture, poultry, and horticulture production—require reallocating land currently zoned as paddy, alluvial, garden, or virgin land to these higher value activities. Conversion of paddy land to aquaculture, for example, can quadruple per acre returns (Belton et al. 2017). For farmers, this flexibility is paramount for accelerating agricultural income growth. It is also important for ensuring national food security in the face of climate change. Shifting rainfall, flooding, and saltwater intrusion into formerly productive lowland areas requires flexibility in land use decisions to ensure sustainability of agricultural production in Myanmar. Implementation of ongoing land policy reforms will therefore need to recognize and enable farmer choice in land use decisions by farmers.

The remaining half of rural households—the landless who currently have no access to productive farmland—require productive assets of some sort if Myanmar is to successfully combat lingering and stubborn high rates of rural poverty. Upgrading of human capital through education reforms, scholarships, and technical training can improve access to remunerative non-farm employment. For landless households who want to farm, options include allocation of rights to farm virgin and fallow land, or voluntary redistribution of existing large commercial estates.

5.2.2 Access to financial services

A substantial share of farmers, traders, and other agri-businesses must often rely on informal markets that charge high interest rates. Limited access to and/or the high cost of finance will likely hold back the adoption of improved agricultural inputs, high-value crops, and improved quality and safety practices by farmers and reduce incentives to invest to assure efficient marketing, processing, and storage for agri-food system agents.

There is a need to widen the reach of the traditional banking and micro-finance institutions to diversify financial products and services available and to make sure that these improved services are inclusive of small farmers, women, ethnic minorities, and other disadvantaged groups. Part of the problem in accessing finance is often financial regulations—such as stringent collateral requirements and interest cap rates (IFC 2020) as well as regulations on the set-up of rural branches (Basu et al. 2020)—that are too restrictive to allow the financial sector to develop. Policies should be

adjusted to improve transparency and bring the regulatory framework more in line with international standards. The merger of the Myanmar Economic Bank and MADB into the Myanmar Retail Bank, and the shift to more flexible and market-rate interest rates, would help the sustainability and growth of the sector. Capacity building at different levels of the finance system—regulators as well as lending institutions—is also required.

The widespread use of smartphones in the country and in rural areas provides significant opportunities to allow for more widespread use of financial markets by embracing new financial technology solutions such as better use of digital mobile money and credit, and e-payment and e-commerce services.

5.2.3 Market access and infrastructure

Improving market access by investing in rural road infrastructure should be a priority as it will better integrate a large, mainly agriculture-dependent, remote population into local and international agricultural value chains. Investments in rural roads have been shown to have high rates of return as it enhances agricultural performance because of access to modern inputs and higher agricultural output prices. They further increase agricultural and non-farm incomes, improve nutrition, and alleviate rural poverty (Stifel et al. 2016).

There are large benefits to be gained from improved urban markets, particularly from investments in efficient urban wholesale markets. Well-organized and up-to-standard urban wholesale markets (with appropriate location, infrastructure, sanitation services, and traffic controls) are crucial for agricultural value chains to control food losses, assure food safety, and keep marketing margins low to the benefit of consumers and farmers alike.

To assure access to the more rewarding and rapidly changing end markets, more attention and coordination of public and private players will be required to meet the increasing consumer needs for food quality, safety, and ethics. Regulators will have to work closely with private value chain agents to facilitate adherence to best practices of quality and safety standards.

5.2.4 Agricultural productivity, sustainability, and export market competitiveness

To improve growth potential for Myanmar's agribusiness exports, public and private sector stakeholders will need to coordinate actions in several key areas.

Competitiveness of Myanmar's agricultural exports will require significant investments to improve productivity and sustainability along the value chain. Major investments are needed to expand and upgrade Myanmar's agricultural research capacity. Agricultural researchers, input suppliers, farmers, processors, and traders will all need to invest in improved technologies and farming practices that are adapted to climate change, mitigate greenhouse gas emissions, and coordinate priorities through regular value chain stakeholder consultations.

China and India have both cut off Myanmar agricultural imports abruptly and unexpectedly at various times, with serious repercussions on domestic suppliers of pulses, maize, rice, and melons. To moderate these problems going forward, the Myanmar government, in consultation with domestic trade groups, will need to negotiate better terms for Myanmar suppliers through bilateral agreements with key importers like India and China as well as through regional trade agreements. Multilateral agreements with members of the Association of Southeast Asian Nations (ASEAN), the Regional Comprehensive Economic Partnership, and through ASEAN-China and ASEAN-India agreements offer potentially increased leverage in what may be tough negotiations with Myanmar's two large neighbors.

Diversification of export markets also offers an important means of risk reduction for Myanmar farmers and exporters. For agricultural exports such as pulses, maize, fresh fruits, and vegetables,

there are large market opportunities in East Asia, particularly when tied with increased value-added processing.

One of the most common complaints on expanding agriculture exports is improving the sanitary and phytosanitary (SPS) certification processes necessary to meet foreign market requirements. It is also critical to develop effective SPS health and safety regulations for domestic consumption (for domestic production and imports). In the longer-term, one of the best ways to have an agricultural system meet international requirements (for export markets) is to have a strong domestic SPS health and safety system. Some work has begun, at a technical level, to develop automated SPS processes, to accept international plant, animal, and food safety standards (CODEX and OIE), and to move enforcement toward risk-based approaches that free up domestic and foreign trade in low-risk products while focusing regulation on high-risk products. As part of these efforts, private exporters will need expanded capacity to provide quality conformity assessment and traceability to access more demanding export markets.

Current low levels of value-added processing—in rubber, pulses, maize, and other farm commodities—reduce potential earnings from Myanmar’s agricultural exports. Recent work on pulses as meat substitutes offer a good model for innovative, forward-looking exploration of agro-processing opportunities (Good Food Institute 2020). In most cases, successful efforts will require strong private sector leadership, including foreign direct investment, coupled with active public involvement and support through value chain task forces or some other similar form of private-public coordination.

Measures to address the above constraints in the medium term will help to ensure that rural economic transformation is more inclusive and resilient than that observed in the decade before COVID-19.

REFERENCES

- ADB (Asian Development Bank). 2017. "The status of infrastructure services in East Asia and the Pacific." Mandaluyong City, Philippines: Asian Development Bank.
- Basu, S., Oo, K.P., Aung, L.L., Moyes, T., Toth, R., and de Brauw, A. 2020. "Agricultural Value Chain Finance in Myanmar." Mimeo.
- Belton, B., Cho, A., Filipski, M.J., Goeb, J., Lambrecht, I., Mather, D., and Win, M.T. 2021a. "Opportunities and constraints for production and income growth in rural Myanmar: Inter-regional variations in the composition of agriculture, livelihoods, and the rural economy." Myanmar SSP Working Paper 07. Washington, DC: International Food Policy Research Institute (IFPRI).
- Belton, B., Win, M.T., Zhang, X., and Filipski, M.J. 2021b. "The rapid rise of agricultural mechanization in Myanmar." *Food Policy* 101.
- Belton, B., Filipski, M., and Hu, C. 2017. "Aquaculture in Myanmar: Fish farm technology, production economics and management." Food Security Policy Project Research Paper 52. East Lansing: Michigan State University.
- Boughton, D., Goeb, J., Lambrecht, I., Headey, D., Takeshima, H., Mahrt, K., Masias, I., Goudet, S., Ragasa, C., Maredia, M.K., Minten, B., and Diao, X. 2021. "Impacts of COVID-19 on agricultural production and food systems in late transforming Southeast Asia: The case of Myanmar." *Agricultural Systems*.
- Boughton, D., S. Makhija, M. Maredia, D. Mather, E. Megill, D. Ortega, E. Payongayong, L. Plataroti, D.J. Spielman, M. Thijssen, and M.T. Win., 2020. "Variety Adoption and Demand for Quality Seed in the Dry Zone of Myanmar." East Lansing: Feed the Future Innovation Lab for Food Security Research Paper 179.
- Diao, X., Aung, N., Lwin, W.Y., Zone, P.P., Nyunt, K.M., and Thurlow, J. 2020. "Assessing the impacts of COVID-19 on Myanmar's economy: A Social Accounting Matrix (SAM) multiplier approach." Myanmar Strategy Support Program Policy Note 05. Washington, DC: IFPRI (International Food Policy Research Institute).
- Ekanayake, I.J., Ambrosio Albala, M., and Jaffee, S.M. 2019. "Benchmarking of Myanmar's Food Systems: Evidence and Strategic Directions." The World Bank.
- Filipski, Mateusz J., Belton, B., Hein, A., Zu, A.M., Htoo, K., Win, M.T., Thu, E.T.T., and Htun, K.M. 2021. "Myanmar migration in a time of transformation: 2011-2020." Myanmar SSP Working Paper 08. Washington, DC: International Food Policy Research Institute (IFPRI).
- Goeb, J., Maredia, M.K., Win, K.Z., Masias, I., Lambrecht, I., Boughton, D., and Minten, B. 2021. "Urban food prices under lockdown: Evidence from Myanmar's traditional food retail sector during COVID-19." Myanmar Strategy Support Program Working Paper 11. Washington, DC: IFPRI (International Food Policy Research Institute).
- Headey, D., Oo, T.Z., Mahrt, K., Diao, X., Goudet, S., and Lambrecht, I. 2020. "Poverty, food insecurity, and social protection during COVID-19 in Myanmar: Combined evidence from a household telephone survey and micro-simulations." Myanmar Strategy Support Program Policy Note 35. Washington DC: IFPRI (International Food Policy Research Institute).
- Headey, D., Cho, A., Lambrecht, I., Maffioli, E.M., and Toth, R. 2021. "Consumer immobility predicts both macroeconomic contractions and household poverty during COVID-19." IFPRI Discussion Paper 2002. Washington DC: IFPRI (International Food Policy Research Institute).
- Mahrt, K., Mather, D., Herforth, A., and Headey, D. 2019. "Household dietary patterns and the cost of a nutritious diet in Myanmar." IFPRI Discussion Paper 1854. Washington, DC: IFPRI (International Food Policy Research Institute).
- MAPSA (Myanmar Agriculture Policy Support Activity). 2022. "Monitoring the agri-food system in Myanmar: Rice millers—November 2021 survey round." Myanmar Strategy Support Program Research Note 73. Washington, DC: IFPRI (International Food Policy Research Institute).
- MAPSA (Myanmar Agriculture Policy Support Activity). 2021a. "Agro-processing, food prices, and COVID-19 shocks: Evidence from Myanmar's rice mills." Myanmar Strategy Support Program Working Paper 09. Washington, DC: IFPRI (International Food Policy Research Institute).
- MAPSA (Myanmar Agriculture Policy Support Activity). 2021b. "Monitoring the agri-food system in Myanmar: Agricultural commodity traders—March 2021 survey round." Myanmar Strategy Support Program Research Note 48. Washington, DC: IFPRI (International Food Policy Research Institute).
- MAPSA (Myanmar Agriculture Policy Support Activity). 2021c. "Monitoring the agri-food system in Myanmar: Agricultural input retailers—March 2021 survey round." Myanmar Strategy Support Program Research Note 49. Washington, DC: IFPRI (International Food Policy Research Institute).
- MAPSA (Myanmar Agriculture Policy Support Activity). 2021d. "Monitoring the agri-food system in Myanmar: Rice millers—April 2021 survey round." Myanmar Strategy Support Program Research Note 53. Washington, DC: IFPRI (International Food Policy Research Institute).
- MAPSA (Myanmar Agriculture Policy Support Activity). 2021e. "Monitoring the agri-food system in Myanmar: Agricultural input retailers—March 2021 survey round." Myanmar Strategy Support Program Research Note 66. Washington, DC: IFPRI (International Food Policy Research Institute).

- MAPSA (Myanmar Agriculture Policy Support Activity). 2021f. "The outlook for Myanmar's inorganic fertilizer use and 2021 crop harvest: An ex-ante assessment. Myanmar SSP Working Paper 10." Washington, DC: IFPRI (International Food Policy Research Institute).
- Ministry of Labour, Immigration and Population. 2020. "The 2019 Inter-censal Survey: The Union Report." Nay Pyi Taw: Department of Population.
- Ministry of Labour, Immigration and Population. 2015. "The 2014 Myanmar Population and Housing Census: The Union Report." Census Report Volume 2. Nay Pyi Taw: Department of Population.
- Mellor, J.W. 2017. "Agricultural Development and Economic Transformation: Promoting Growth with Poverty Reduction." *Palgrave Studies in Agricultural Economics and Food Policy*.
- MOALI. 2018. Myanmar Agricultural Development Strategy. Nay Pyi Taw: MOALI.
- Oo, T.Z., Minten, B., Headey, D., Lambrecht, I., and Goudet, S. 2020. "Monitoring the impacts of COVID-19 in Myanmar: Food vendors-November 2020 survey round." Myanmar Strategy Support Program Research Note 40. Washington, DC: IFPRI (International Food Policy Research Institute).
- Stads, G., Nin Pratt, A., Omot, N., and Pham, M.T. 2020. "A cross-country analysis of resource allocation, performance, and impact on productivity." Washington DC: IFPRI (International Food Policy Research Institute).
- USDA (United States Department of Agriculture) Foreign Agricultural Service. 2021. "Burma: Beans and pulses update."
- Win, M.T., Belton, B., and Zhang, X. 2018. "Myanmar's Rural Revolution: Mechanization and Structural Transformation." Chapter in *Myanmar Transformed? People, Places and Politics*, edited by Justine Chambers, Gerard McCarthy, Nicholas Farrelly, and Chit Win (Singapore: ISEAS - Yusof Ishak Institute, 2018).
- World Bank. 2017. "Myanmar Agriculture Public Expenditure Review: Increasing the Impact of Public Spending on Agricultural Growth." Washington, D.C. World Bank.
- World Bank. 2019. "Enabling the Business of Agriculture 2019." Washington, DC: World Bank.

APPENDIX

Table A.1. Size of shock (percentage reduction) assumptions by sector and quarter used for micro-simulation analysis

	Fiscal year 2021 (% reduction)				
	Q1 COVID-19 recovery	Q3 Large effects	Q3 Modest effects	FY2021 Large effects	FY2021 Modest effects
Agriculture					
Wages - permanent	-3	-16	-6	-9	-4
Wages - temporary	-3	-16	-6	-9	-4
Cereals	-4	-21	-8	-3	-6
Pulses & oilseeds	-3	-21	-8	-11	-5
Root crops	-1	-10	-3	-5	-2
Fruits & vegetables	-4	-19	-8	-12	-6
Sugarcane	-2	-17	-6	-8	-3
Beverage crops	1	-18	-6	-3	0
Other crops	-3	-26	-11	-11	-5
Poultry	-6	-29	-12	-18	-9
Other small livestock	-2	-12	-4	-7	-3
Large livestock	-2	-17	-6	-9	-4
Fish	-3	-13	-5	-9	-4
Mining and quarrying income	-3	-48	-22	-32	-18
Manufacturing income	-6	-22	-9	-15	-7
Electricity, gas, water supply, waste management income	-4	-17	-7	-11	-5
Construction income	-16	-57	-27	-39	-22
Wholesale and retail trade income	-10	-39	-18	-28	-15
Transportation and storage income	-9	-35	-16	-24	-13
Hospitality, communication, finance, real estate income	-12	-46	-21	-29	-17
Professional/sci. Activities income	-8	-48	-22	-28	-15
Administrative, public admin income	-6	-23	-10	-16	-9
Educ., health, social work income	-6	-23	-10	-16	-9
Transfer income	0	-100	-100	-67	-67
Domestic Remittances	-6	-50	-6	-35	-6
International Remittances	-6	-50	-6	-35	-6

Note: All government transfers are assumed to have stopped following February 1, consistent with observations from field surveys

Source: Authors' calculations

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