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Supply chain disruptions, thick borders, & food insecurity

An update on the present state
of Myanmar's transport and
logistics sector



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**AN UPDATE ON THE PRESENT STATE OF
MYANMAR'S TRANSPORT AND LOGISTIC SECTOR**

SUPPLY CHAIN DISRUPTIONS, THICK BORDERS, AND FOOD INSECURITY

June 2024

Preface and Acknowledgements

This report presents an overview of the present state of Myanmar's transport and logistics sector. It examines trade flows, connectivity patterns, and constraints affecting the efficient distribution of goods and how rising transportation and trade costs and constraints contribute to food and fuel prices, affecting food insecurity.

The report was prepared by Cordula Rastogi (Senior Transport Economist), Sadig Aliyev (Infrastructure Program Leader), Daria Ulybina (Data Scientist), Win Htein Lin (Transport Consultant), Aka Kyaw Min Maw (Trade Consultant), Myint Kyaw (Operations Officer) and May Oo Mon (Program Assistant) under the guidance of Benedict L. J. Eijbergen (Practice Manager, Transport), Mariam J. Sherman (Country Director) and Sudeshna Ghosh Banerjee (Regional Director, Infrastructure). The team appreciates valuable guidance received from peer reviewers Kim Alan Edwards (Program Leader), Valens Mwumvaneza (Senior Agricultural Economist), Rajesh Rohatgi (Lead Transport Specialist, Program Leader), and Chanin Manopiniwes (Senior Transport Economist).

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Executive Summary

Trade and transport connectivity is an important determinant of development and stability, particularly so in conflict-affected and fragile environments (Chen, et al. 2019). The cost of transport is also a significant factor impacting food prices and food security, particularly in the world's poorest countries, where food expenses can reach up to 70 percent of household expenses (World Bank, 2024a). Supply chain disruptions, such as those triggered by the COVID-19 pandemic, conflicts, and the effects of climate change, can lead to a complex set of challenges that increase the cost of trading and transporting food products, affecting the entire food supply chain from producers to consumers.

Myanmar is presently experiencing political instability and conflicts that have led to supply chain disruptions. The February 2021 military takeover has had effects on the economic conditions of the country, which shares borders with countries that comprise roughly 40 percent of the global population (World Bank, 2023b). Conflict escalation and border trade disruptions in the second half of 2023 have added layers of complexities to the transport and logistics sector, already constrained by restrictive regulations, control, and security risks. This has triggered transport and logistics operating costs to rise and has resulted in significant supply chain disruptions.

Before 2021, Myanmar had made gradual progress in enhancing its transport and trade connectivity, both internally with infrastructure upgrades and policy reforms, as well as externally cultivating trade ties with neighboring countries and across the world. Since 2021, the economic conditions in Myanmar have deteriorated. The latest World Bank estimates indicate that GDP currently remains around 10 percent below 2019 levels, in sharp contrast to the rest of the East Asia region. Firms are dealing with a range of operating challenges and struggling to obtain foreign currency, trade licenses, and imported inputs.

Myanmar's transport and logistics sector has been significantly impacted by security concerns along major transport corridors, border disruptions, as well as other related obstacles since 2021. Critical infrastructure such as roads, bridges, and railways have been attacked, leading to disruptions in transportation. Consequently, road freight transportation has become increasingly unsafe and unreliable, with the time and cost of travel fluctuating greatly across different routes due to the prevailing security situation. The obstruction of crucial transport routes has impeded the mobility of its citizens and the domestic distribution of commodities.

Even prior to 2021, trade costs were comparably high in Myanmar. According to the UNESCAP-World Bank trade cost database, trade costs in Myanmar, as measured in ad valorem were over 300 percent in 2020, tripling the cost of internationally traded goods in comparison to domestic goods. Trade costs, which constitute policy and regulatory barriers (tariffs and non-tariff barriers), logistics costs (freight and time costs) as well as other costs¹

¹ These include communication costs and other information costs, enforcement costs, exchange rate costs, legal and regulatory costs and local distribution costs.

can fluctuate solely due to changes in domestic policies as opposed to changes in the external environment (World Bank, 2021a). Thick borders, in this context, refer to those domestic restrictions or “behind the border” costs that affect international trade.

More recent shifts in trade patterns (formal and informal), higher logistics costs, and limited transport accessibility have caused the costs of domestic and international trade to rise further in Myanmar (World Bank, 2024b). In 2023, logistics costs rose further due to a surge in fuel prices and various transport disruptions. These included stringent travel authorization protocols, a proliferation of road checkpoints, the prevalence of informal payments, and a scarcity of vehicle spare parts. This is affecting the operation of transportation and logistics services, an industry with an estimated value of about 11 percent of GDP².

This rise in trade and logistics costs is contributing to food insecurity in Myanmar. The critical function of transport and logistics in safeguarding food security lies in their ability to facilitate the availability of food and ensure that households can access it, which is achieved through proper infrastructure, storage solutions, and reliable transportation services (Pinto et al., 2023). As disruptions in transportation have affected the supply chains for agricultural goods and other food items, food security in Myanmar has become increasingly vulnerable. The regions most impacted are the northern and western parts of Myanmar, including Sagaing, Magwe, Chin, Rakhine, Kayah, Kayin, Kachin, and Shan States. Across the country, food insecurity has intensified, resulting in the worst humanitarian crisis in recent memory affecting approximately 12.9 million people (WFP, 2024).

This report examines the transport and trade challenges, ‘border thickness’, and their effect on food insecurity in Myanmar. Leveraging novel, granular high-frequency data at shipment and vessel level, this report provides new insights into the present state of Myanmar’s trade, transport, logistics, and evolving supply chain connectivity. It examines the extent of disruptions unleashed in the aftermath of the 2021 military takeover, assessing the impact on trade and transport flows, transport accessibility, fuel price, and food security. The study uses various available data sources, including AIS³-data as well as information from operators disaggregated official customs data from neighboring countries, food price monitoring datasets (from the World Food Program and FAO) as well as geospatial accessibility and mobility data⁴. Given the paucity of official transport and trade data reported by the Myanmar authorities, the report draws extensively on data collected by other stakeholders to assess actual flows, volumes, as well as operational constraints.

The key conclusions of the report are as follows:

- 1. Despite increasing challenges, the maritime freight transportation and logistics industry managed to maintain a level of resilience, albeit with significant cost**

² According to Modor Intelligence (2024), the industry has an estimated value of USD7.29 billion.

³ Automatic identification system (AIS) used on ships.

⁴ Given the paucity and known low quality of official trade and transport data reported by Myanmar, the report draws extensively on data collected by other stakeholders to assess actual flows, volumes, as well as operational constraints.

increases. This is not the least due to the industry's core role in facilitating the movement of products, connecting suppliers with consumers, and enabling businesses to operate. Over 2020-2023, shipping capacity offered for containerized goods has been relatively steady at about 800,000 containers (twenty-foot equivalent units, TEUs) per annum (2021 experienced a drop, Figure 11), with ships spending on average around 2 to 2.5 days in Yangon's ports during a port call. With constant container handling performance and berth utilization rate, Yangon's ports, which handle most of Myanmar's international trade, have demonstrated to be relatively resilient.

2. **Disruptions affecting domestic and international shipping, as well as ancillary transport and logistics operations, are mostly driven by factors outside individual firms' control.** Contributing factors include increased fuel and replacement costs, restricted access to foreign currency, stringent foreign exchange transaction regulations, extended lead times for outbound payments, security concerns, and additional hurdles encountered along transport corridors (World Bank, 2024b). The trucking sector survey revealed that the rise in fuel prices directly impacted operational costs, prompting freight rates to climb by up to 80 percent in 2023 as compared to 2020⁵. Fuel prices may also be affected by the increased waiting and discharge time of tankers at Yangon's ports (up to 8 days in October 2023), given the shortage of foreign currency.
3. **These disruptions have prompted a shift toward informal trade and transport networks.** Informal (or underreported) trade and transportation of goods through land borders appears to be on the rise: the gap between Myanmar's reported trade with its neighbors is widening based on mirror data analysis (World Bank, 2024b). While Myanmar's reporting and Thailand's mirror trade data follow the same trend, the gap between Myanmar's recorded imports from Thailand and Thailand's recorded exports to Myanmar is about USD 200 million in November 2023. Those trends seem to reflect the tightening licensing procedures for official and formal trade, making it extremely difficult for businesses to bring in vital consumer goods, manufacturing inputs, and machinery through official channels.
4. **Limited transport accessibility, particularly to remote areas often located along corridors in conflict zones, contributes to price increases of essential goods.** The challenges of remoteness and transportation barriers, such as checkpoints, road closures, and the need for travel permits, exacerbate the situation by causing shipment delays and cost increases. The correlation analysis presented reveals that the highest reported levels of food price inflation are observed in states with low levels of transport accessibility (Chin, Rakhine, Sagaing, North Shan). Cooking oil price increases have been found to be positively and strongly associated with transport accessibility indicators (Pearson's coefficient of 0.83). Accessibility constraints, in

⁵ Prices vary widely between routes and are impacted by a range of factors, including commodity type, level of competition, demand, road conditions, season, travel time, security and operating costs, including official and unofficial toll and checkpoint payments.

combination with government-imposed price controls and restrictions, as well as weakened agricultural output, contribute to food inflation and insecurity.

The report is structured as follows: Chapter 1 analyzes formal trade flows, connectivity patterns, and constraints affecting the efficient distribution of goods (imports and exports) through Myanmar's international maritime gateways, namely the ports of Yangon. This will be followed by a chapter assessing characteristics of border trade with China and Thailand highlighting the rise in informal trade. Based on the assessment of disruptions to supply chains and the evolution of formal and informal trade, Chapter 3 will examine how rising trade costs and constraints to transport accessibility are contributing to the rise of food and fuel prices, affecting food insecurity.

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List of Abbreviations

ACLED	Armed Conflict Location & Event Data Project
AIS	Automatic Identification System (used on ships)
CBM	Central Bank of Myanmar
CHN	People’s Republic of China
CIESIN	Center for International Earth Science Information Network
EBA	Everything But Arms (initiative)
ERW	Explosive remnants of war
FAO	Food and Agricultural Organization (of the United Nations)
FPMA	Food Price Monitoring and Analysis
GADM	Global Administrative Areas
GDP	Gross Domestic Product
GSHHG	Global Self-consistent, Hierarchical, High-resolution Geography Database
GSP	Generalized Scheme of Preferences
JRC	Joint Research Center
Kg	Kilogram
L	Liter
MMK	Myanmar Kyat
NASA	National Aeronautics and Space Administration
MT	Metric tons
TEU	Twenty-foot equivalent unit
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
USD	United States Dollar

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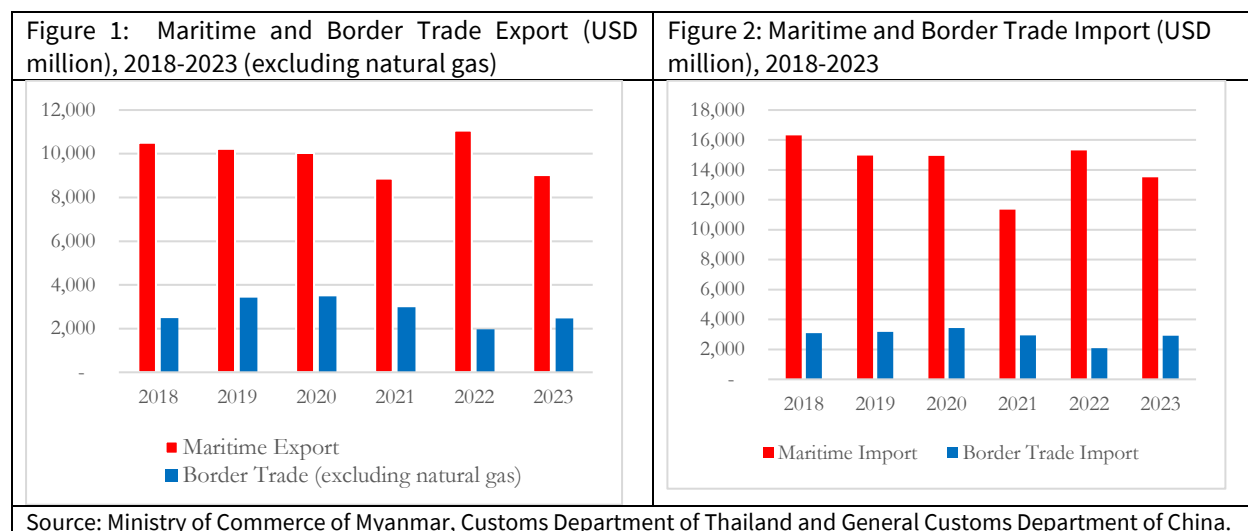
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Map 1: Myanmar Railway Network, Conflict and Accessibility

1. Supply Chain Disruptions and the Resilience of Maritime Transport

As the main gateways of international trade, Yangon’s seaports have played a crucial role in Myanmar’s economic growth and seaborne trade since 2011. From 2018 until 2023, the primary gateway, the Ports of Yangon handled approximately 80 percent of Myanmar’s international trade in goods in value terms, including 78 percent of exports (excluding natural gas) and 83 percent of imports, respectively (Figure 1 and 2). Amidst the ports, the Myanmar International Terminal, known as Thilawa Port stands out as the largest terminal in the country. Situated near the Thilawa Special Economic Zone, it accommodates Roll-on/Roll-off ships, container and bulk vessels handling diverse cargo from rice to coal and metal and has cutting-edge port equipment.



Maritime Containerized Trade

While Myanmar's shipping industry had experienced progress, containerized trade has been declining since 2021. Import price inflation (in kyat terms), foreign exchange shortages, and stringent trade licensing procedures are the main drivers behind significant declines in laden containers entering the country through Yangon’s seaports (Figure 3). In 2021, the import of laden containers has plummeted by nearly 50 percent compared to 2020 levels, stabilizing in January 2022 at around 30,000 twenty-foot equivalent units (TEUs) per month but subsequently declining further to 25,000 TEUs in 2023 (Figure 4). Growing restrictions on imports and exports are among the drivers for this decline.

Figure 3: Container throughput at Yangon Ports (TEUs), 2016-2023

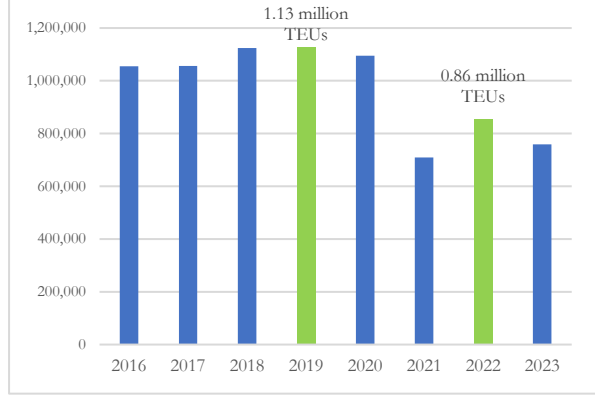
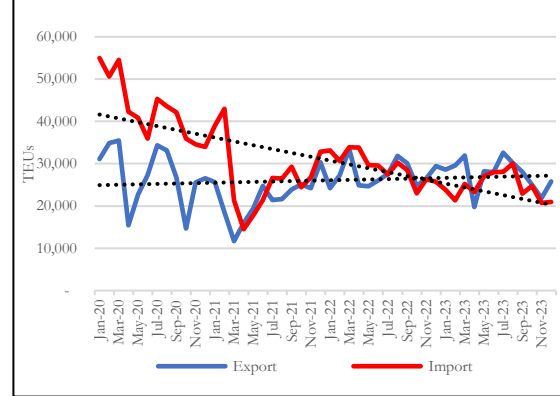


Figure 4: Export and Import of Laden Containers via Yangon Ports (TEUs), 2020-2023



Source: Shipping Companies.

The decrease in import volumes has indirectly affected Myanmar's export trade by causing a shortage of containers. This shortage becomes particularly problematic when demand is high, as exporters are forced to deal with the unavailability of containers, incurring additional costs due to increased freight rates for the importation of empty containers. In 2023, the import of empty 20-foot containers, which are mainly used for agricultural exports, increased threefold compared to 2019 (Figure 5). This lack of container availability has resulted in missed opportunities and the loss of potential benefits for the agricultural export sector.

Figure 5: Export and Import of Empty 20' Containers (TEUs), 2019-2023

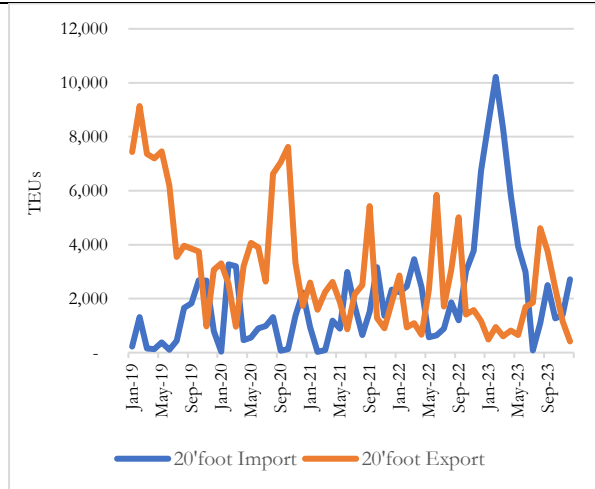
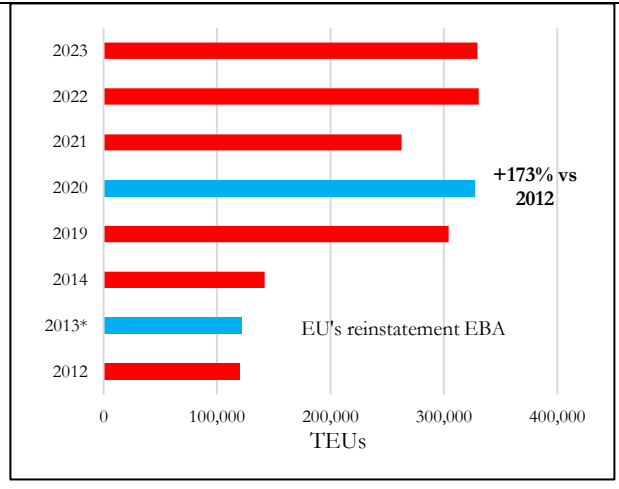


Figure 6: Total Laden Container Exports (TEUs), 2012-2023, annual

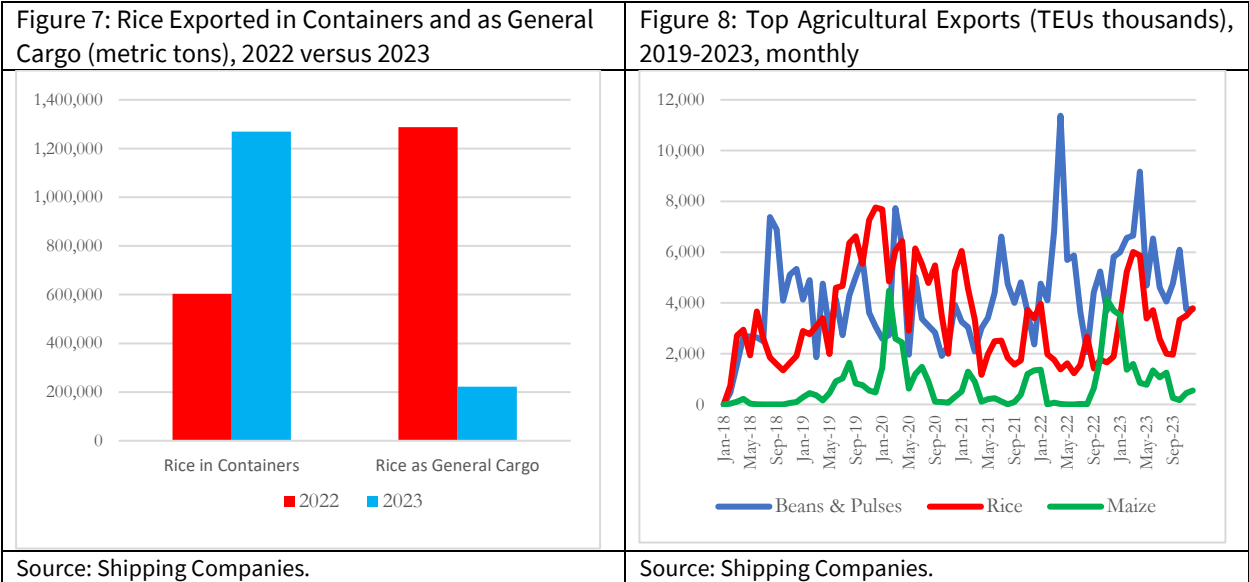


Source: Shipping Companies.

Growing restrictions imposed on traders are significantly impacting maritime shipping services, resulting in the decline of laden containers (mostly imports), especially since the first quarter of 2022 (Figure 4). Total containerized seaborne trade (import and export) in January 2022 and January 2023 was at about 66 percent and 61 percent of the volumes

recorded in January 2020. According to discussions with industry representatives, international shipping companies are navigating the evolving landscape of Myanmar’s trading environment as they shift from ocean freight to intermodal transportation through neighboring countries overland, leverage strategic storage facilities⁶, and navigate through the intricacies of current payment structures (World Bank, 2023b), adding an additional layer of complexity.

Exports of garments, the backbone of Myanmar’s trade, have gained momentum since 2012 but have flattened in 2021 (World Bank, 2024b). Over the period of 2013 to 2020, exports of these products experienced a growth of 173 percent (Figure 6). The sector’s initial growth was driven by several factors, including access to preferential duties through the EU’s and United States Generalized Scheme of Preferences (GSP) following the so-called Everything But Arms (EBA) initiative. The garment sector, however, contributes to relatively small foreign exchange inflows, mainly for staff and operational expenses, as payments and contracts often handled offshore in the region are estimated to amount to only a quarter of the export value (World Bank, 2023c; EuroCham, 2022).

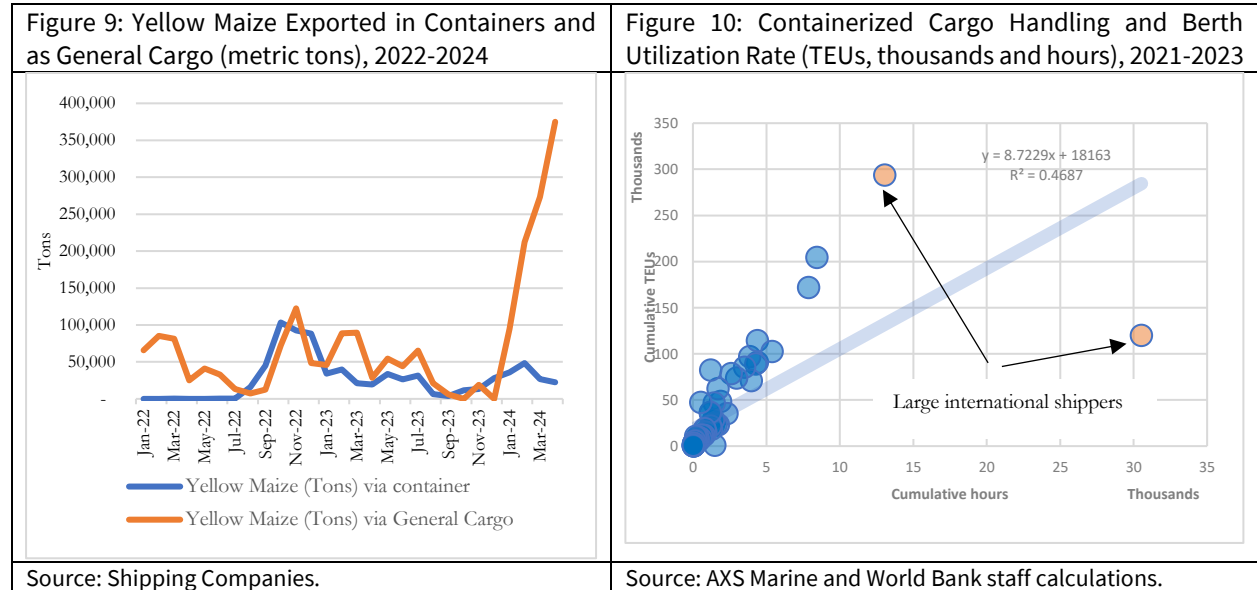


In contrast, export earnings from agricultural products (rice, beans, and pulses) are providing important foreign currency inflows. Due to a shortage of containers caused by the COVID-19 pandemic supply chain crisis, exporters turned to stacking rice in general cargo vessels. This practice continued until 2022 when only about 32 percent of rice exports were carried in container vessels. This share increased to 85 percent for rice exports in 2023, resulting in the need for containers and container vessel capacity (Figure 7).

Compared to manufactured trade (garments), the export of agricultural products has seen significant spikes (Figure 8). Contrary to the rise in containerization of rice exports, the export of yellow maize as general cargo has picked up starting in January 2024. During the month of

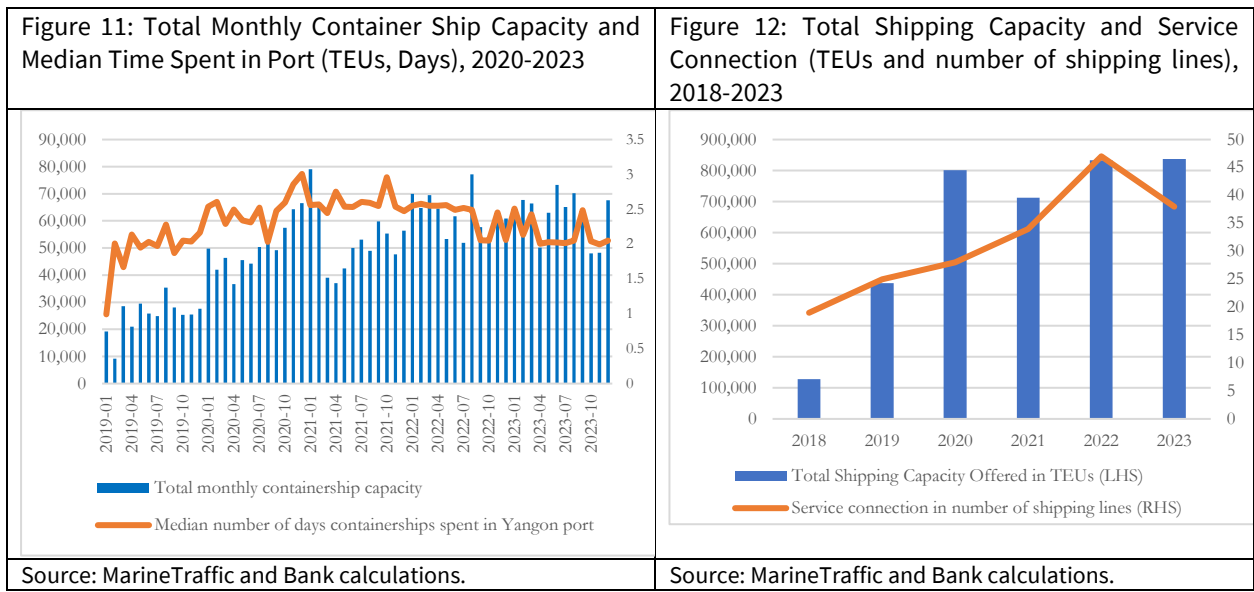
⁶ The use of bonded warehouses has risen substantially.

April 2024, roughly 375,000 tons of yellow maize were exported as general cargo, a ten-fold increase as compared to total containerized and non-containerized maize exports in November 2023 (Figure 9). This recent trend confirms the existing container shortage for exports and the need for foreign currency inflows.



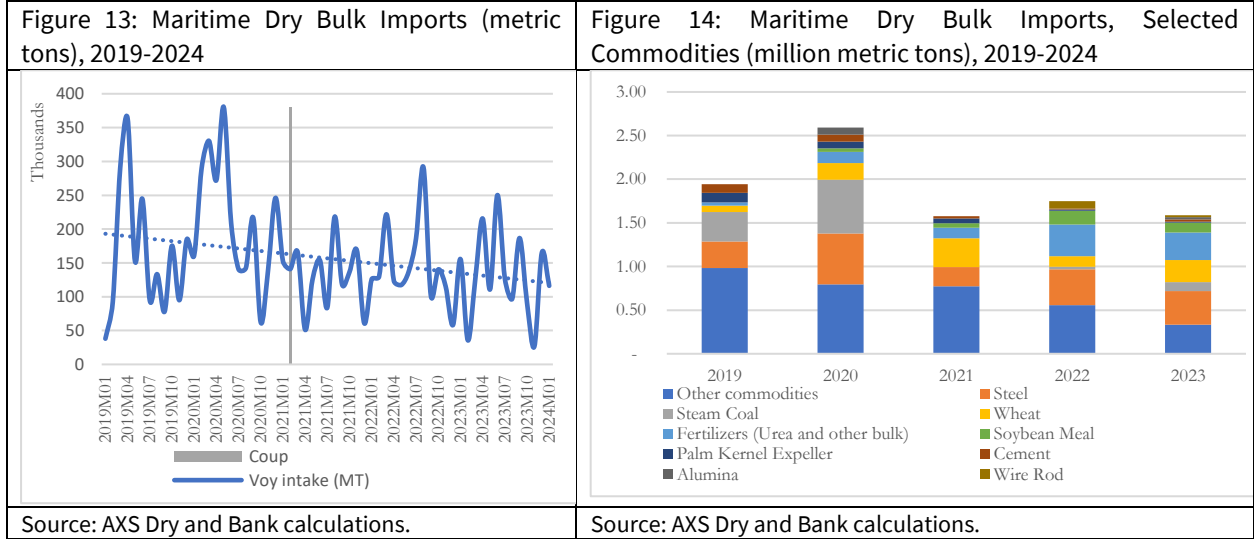
Notwithstanding challenges in-country, container handling performance at Yangon’s ports appears to be efficient during 2021-2023. Operational efficiency can be described as the proportional relationship between vessel capacity and berth utilization (Figure 10), which is rather homogenous except for large international shipping carriers, which transport most of the country’s machinery, garments input, and output (about 80 percent). This may potentially highlight inefficiencies in the port-hinterland connection (requiring the waiting for deliveries to be loaded) and/ or the operations at ports, e.g., the sailing to two different terminals within Yangon ports (one to offload imports and one to load exports, e.g., garments).

Despite initial disruptions in 2021, Yangon’s seaports demonstrated relative resilience, which is threatened by the stagnation of offered shipping capacity. Initial hurdles arose due to insufficient labor at shipping ports, impacting the movement of containerized goods and the median time spent in port in relation to shipment volumes handled (Figure 11). While container throughput decreased over 2020-2021 (from about 1.1 million to 0.7 million TEUs), the total number of liner shipping services that included Yangon in their routes did not decline significantly. Instead, the number of services calling at the port grew through 2022, with a decline observed only in 2023. About 37 different liner shipping services served the port of Yangon in 2023, which is slightly higher than in 2021 (Figure 12), but this is on a declining trend.



Maritime Dry Bulk Shipments

Over 2021-2024, maritime dry bulk shipments, discharged at Yangon Ports illustrate a downward trend in volumes (Figure 13). The apparent drop in the import of steam coal, primarily used for power generation as well as steel point to the declared self-sufficiency policy and slowing construction activity (Figure 14). Both imports of wheat and fertilizer (urea and other bulk) have seen substantial growth in 2022. Soybean meal import, representing the largest US agricultural export to Myanmar in 2020 and mostly used for animal feeds, stopped altogether in 2021, compared to 2020 which saw volumes of over 600,000 metric tons. According to the Myanmar Animal Feed Mill Association, import permits and logistics are some of the biggest issues faced when importing U.S. soybean meal⁷.

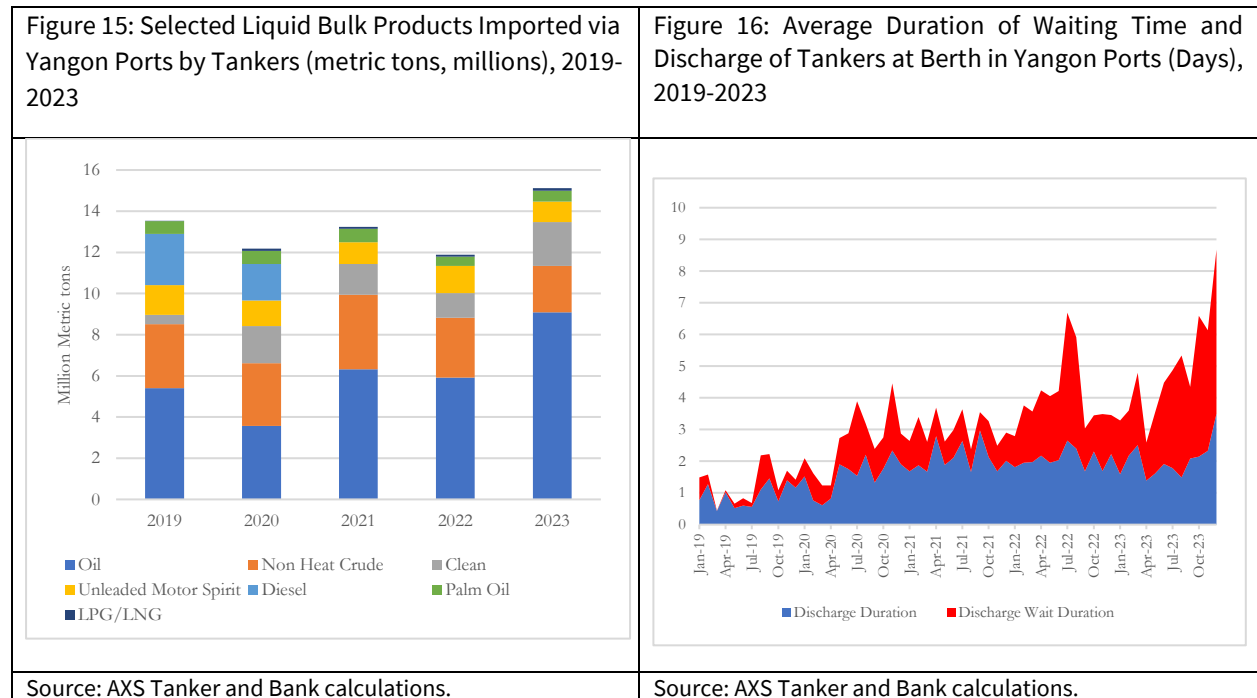


⁷ https://ussec.org/wp-content/uploads/2024/02/USSEC_Country_Market_Snapshot_2024_V2_Myanmar.pdf

Liquid Bulk Imports

Myanmar currently meets 96 percent of its domestic petroleum demand through imports, with most of it used for industrial production and transportation. The greatest volume of liquid bulk is oil, followed by non-heat oil, while the import of diesel experienced a significant drop, according to the latest World Bank’s Economic Monitoring Report for Myanmar (World Bank, 2024b; Figure 15).

Restrictive trade policies, in combination with the shortage of foreign currency, are well documented by the significant increase in the average time spent by tankers waiting to be discharged at Yangon’s ports. While the CBM prioritizes U.S. dollars to import fuel, edible oil, and pharmaceuticals, the delays recorded for tankers waiting to berth or at berth are evident (over 8 days at the end of 2023). Increased waiting duration at anchorage (discharge wait duration) does not point to operational inefficiencies at Yangon’s ports, as evidenced by historical data covering the period before the start of the COVID-19 pandemic (Figure 16).

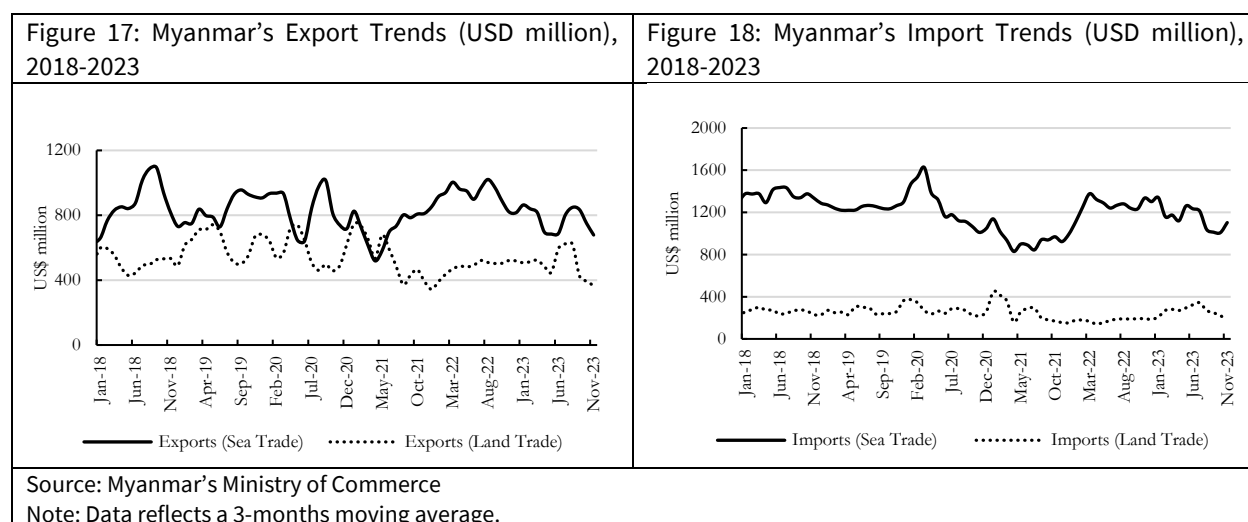


The reduction in maritime trade and the stagnant vessel capacity offered, along with trade uncertainties, is likely to affect the transport and shipping options available for Myanmar's businesses. Since 2021, Myanmar’s supply chains have been significantly disrupted, particularly import channels for manufacturing and other inputs via maritime shipping routes as well as export channels due to container shortages. A reduction in exports is expected to lead to diminished shipping connectivity, which in turn will likely reduce the volume of imports arriving through official channels.

2. Emerging Trends in Informal Cross-Border Transport and Trade

According to official statistics by Myanmar, reported land-based border trade (including gas exports) with neighboring countries shows signs of stagnation or fall (Figures 17 and 18). According to these statistics, the border trade of Myanmar with neighboring countries represents about 15 percent of exports and 18 percent of imports in USD terms, respectively, in 2023 (excluding gas exports). Comparing the period of October-March 2024 with the previous year, border exports decreased by 27 percent (World Bank, 2024b). Like trade with China, Myanmar’s exports to Thailand are transported primarily through land borders, which is attributable to a considerable share of gas exports through overland pipelines.

The conflicts affected the dynamics of transport and trade across borders, as reflected in official statistics. The escalation of conflicts in strategic border towns and the blockading of trade routes disrupted the usual flow (World Bank, 2024b). The Muse and Chin Shwehaw trading points are critical for border trade movements with China, whereas the Myawaddy trading point serves as the main gateway for non-gas-related trade with Thailand, catering to imports and exports.



Informal⁸ (or underreported) trade (World Bank, 2022⁹), **both imports and exports with Myanmar’s neighboring countries through land borders, appear to be on the rise.** The growth of unrecorded trade can be seen in the widening gap in corresponding trade statistics between Myanmar and its neighboring countries, which points to signs of informality (Figures 19, 20, 21, and 22). However, this may not represent the exact value of informal trade¹⁰. More trade is likely crossing the border informally, which is not reflected in official figures.

⁸ Informal trade in this context is defined as trade that is not recorded by Myanmar or its neighboring country.

⁹ The rise of informal trade was covered in World Bank (2022, Box 1), the presented analysis is an update with a view to assess the thickening of borders.

¹⁰ The data may be influenced by (i) incorrect tariff classifications, (ii) time-lags in cross-border transshipment or delayed data recording, (iii) errors in the indicated provenance or destination, (iv) erroneous currency conversions, (v) recording methods

Figure 19: Myanmar's exports to China (USD million), 2018-2023

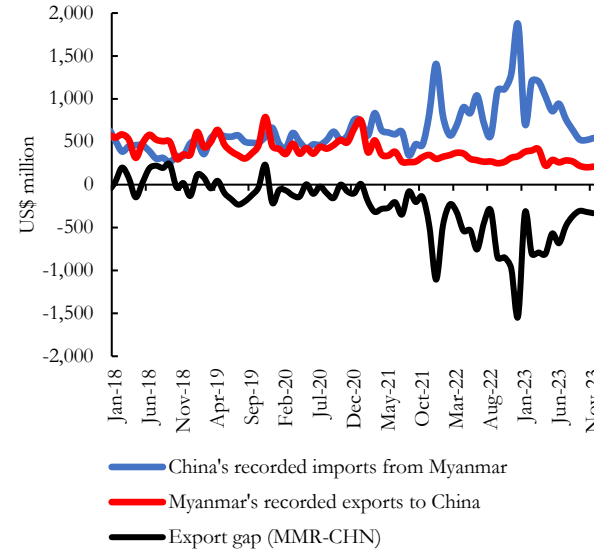
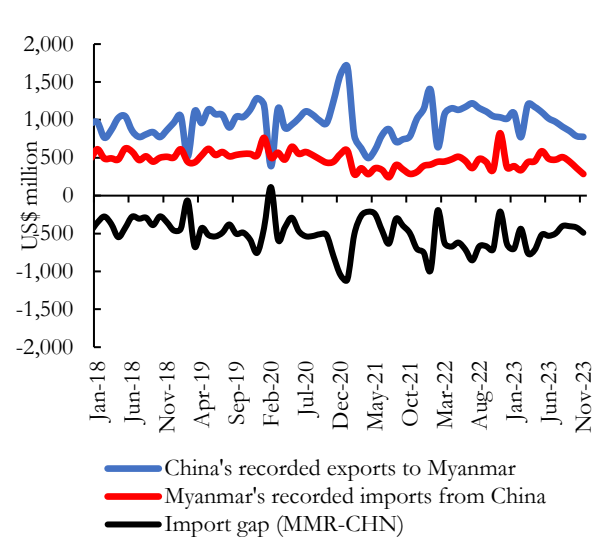


Figure 20: Myanmar's imports from China (USD million), 2018-2023



Source: The General Customs Department of China, the Central Statistical Organization of Myanmar, and the Ministry of Commerce of Myanmar

Figure 21: Myanmar's exports to Thailand (USD million), 2018-2023

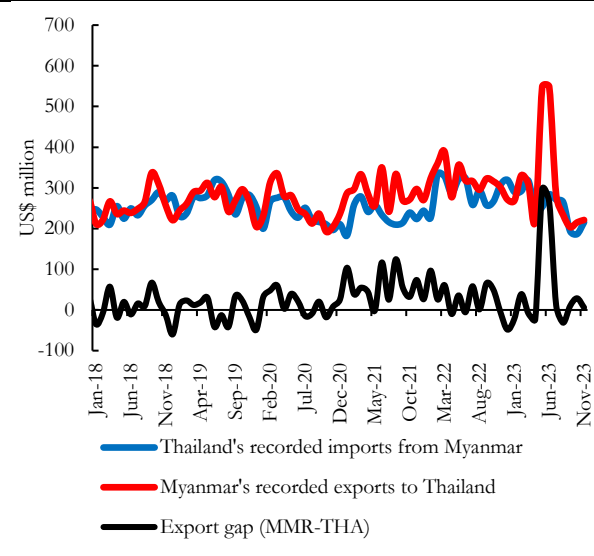
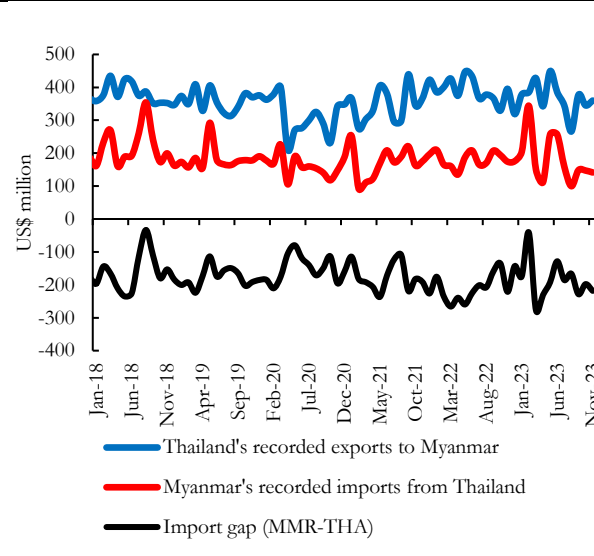


Figure 22: Myanmar's imports from Thailand (USD million), 2018-2023

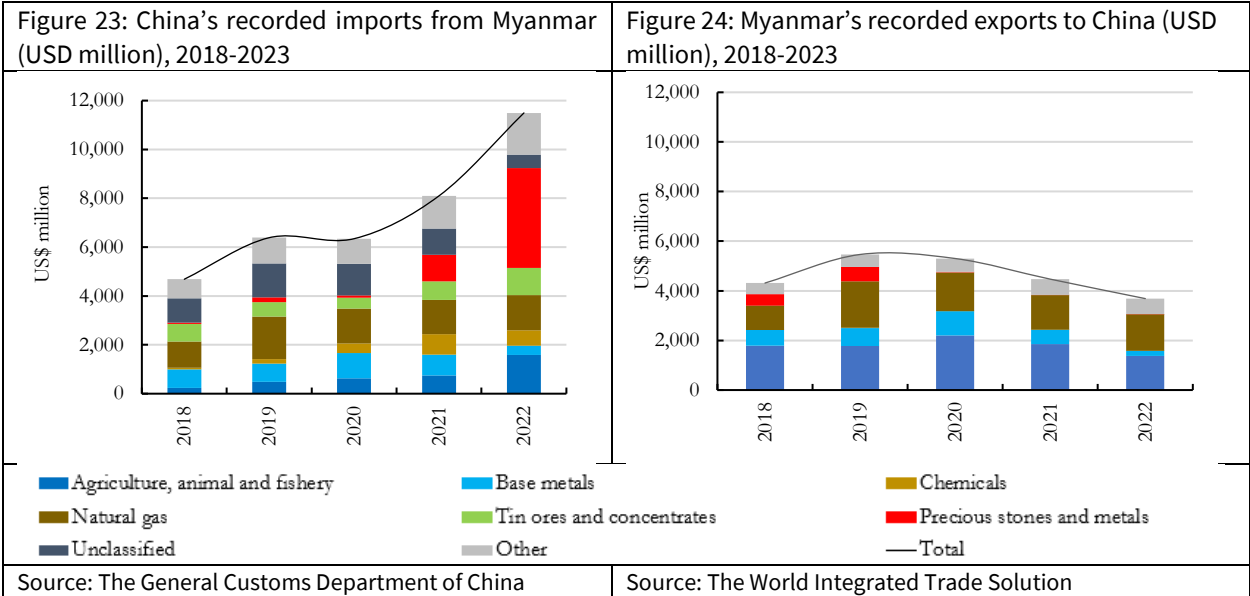


Source: The Customs Department of Thailand, the Central Statistical Organization of Myanmar, and the Ministry of Commerce of Myanmar

Note: The data for Myanmar's recorded exports to Thailand is extracted from year-to-date cumulative value published by the Ministry of Commerce. There is missing data for May 2023; hence, the difference between April 2023 and June 2023 is calculated and divided by two to impute monthly values for May and June 2023. The spikes in May and June 2023 for Myanmar's recorded exports to Thailand are likely a data issue.

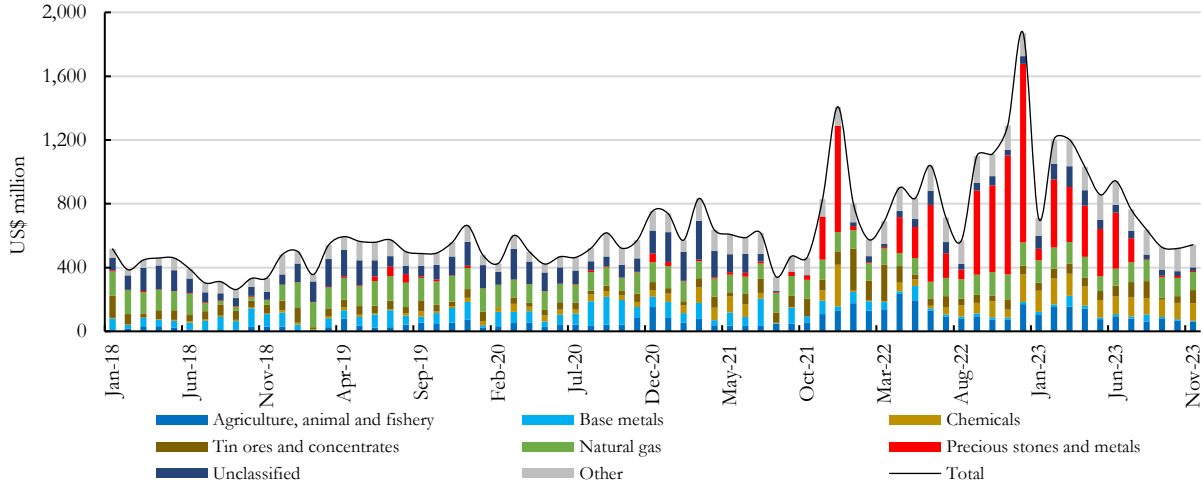
by importers (cost, insurance and freight, CIF and exporters, free on board, FOB), and (vi) inaccurate reporting of transit trade (Cantens, 2015).

Notwithstanding potential accuracy issues in international trade statistics, since February 2021, the gap in reported trade with China is on the rise, mainly driven by Myanmar’s exports of natural resource base as well as agricultural products. The analysis indicates that Myanmar either under-reports or does not report exports of certain products (Figures 23 and 24). At the same time, Myanmar recorded higher agricultural export values to China than the neighboring country’s import values of the same categories. Moreover, a huge number of unclassified products (primarily countertrade of border residents and products traded through similar schemes) is likely to contribute to this gap. In terms of destination, about two-thirds of Myanmar products go to Yunnan province, and Guangdong province also accounts for a significant share of exports from Myanmar, primarily jade.

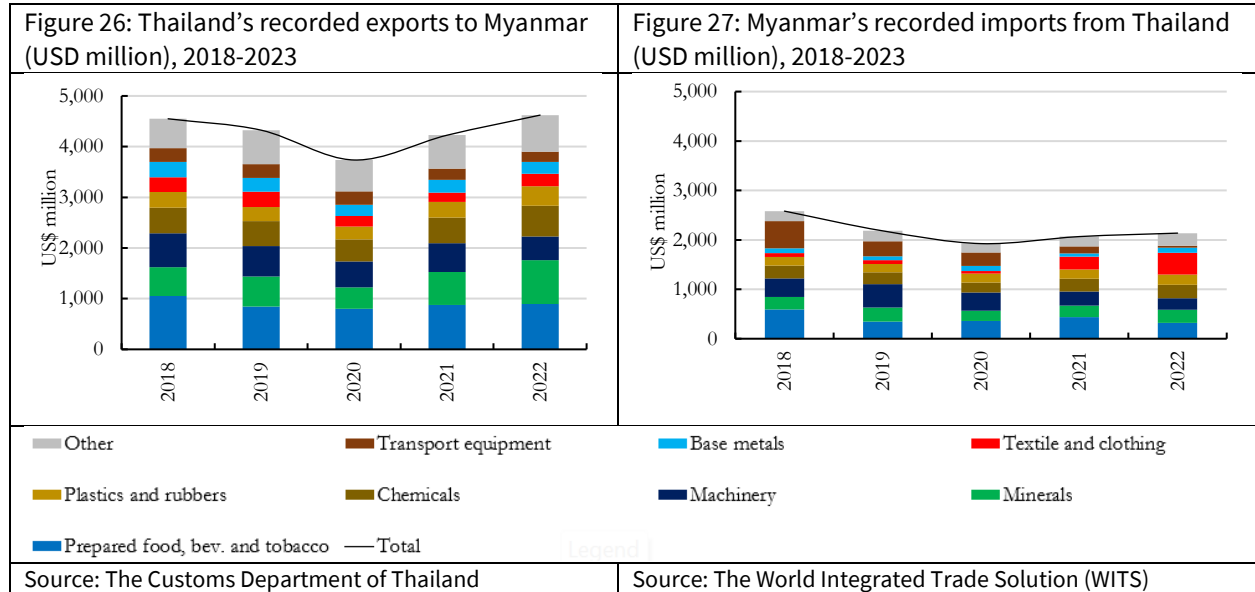


Myanmar's primary exports to China are natural resource-based products, and recent spikes in Myanmar exports to China have been largely driven by precious stones and metals (Figure 25, World Bank, 2024b). Moreover, a huge number of unclassified products (primarily countertrade of border residents and products traded through simplified trade procedures) could likely contribute to the gap. Natural-resource-based products are likely exported informally out of Myanmar. On the other hand, Myanmar authorities do not appear to recognize the countertrade of border residents as part of the official trade.

Figure 25: China's recorded imports from Myanmar (USD million), 2018-2023

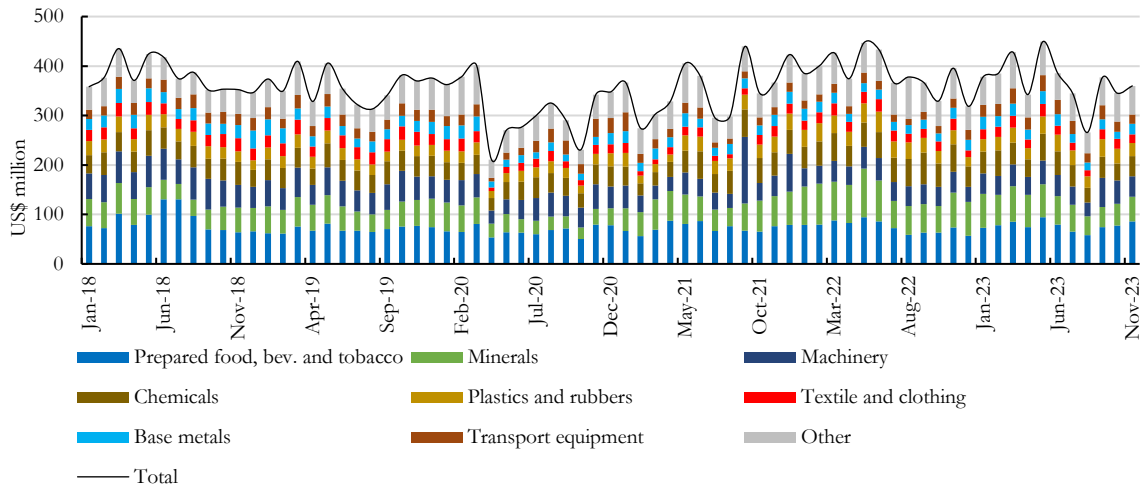


Significant under- or unrecorded imports of a wide range of products from Thailand, which are twice as high as the reported data from Myanmar are crossing the land border, not included in official Myanmar's statistics. The large gap, equivalent to approximately the size of Myanmar's recorded import value in 2023 (up to November), is an indication that official or formal trade is too costly (e.g., restrictive licensing procedures), making it difficult for businesses to bring in vital consumer goods, manufacturing inputs, and machinery through official channels. This includes three main products: processed foods, minerals (cement and fuels), and machinery (Figures 26 and 27). In addition, it also reflects the shifting of formal trade to informal trade due to the restrictions of importing certain products through land borders, such as condensed milk, raw milk, coffee, and tea mix (Figure 28).¹¹



¹¹ <https://ilawasia.com/myanmar-imposed-a-ban-on-products-not-allowed-to-import-through-the-border-areas/>

Figure 28: Thailand's recorded exports to Myanmar (USD million), 2018-2023



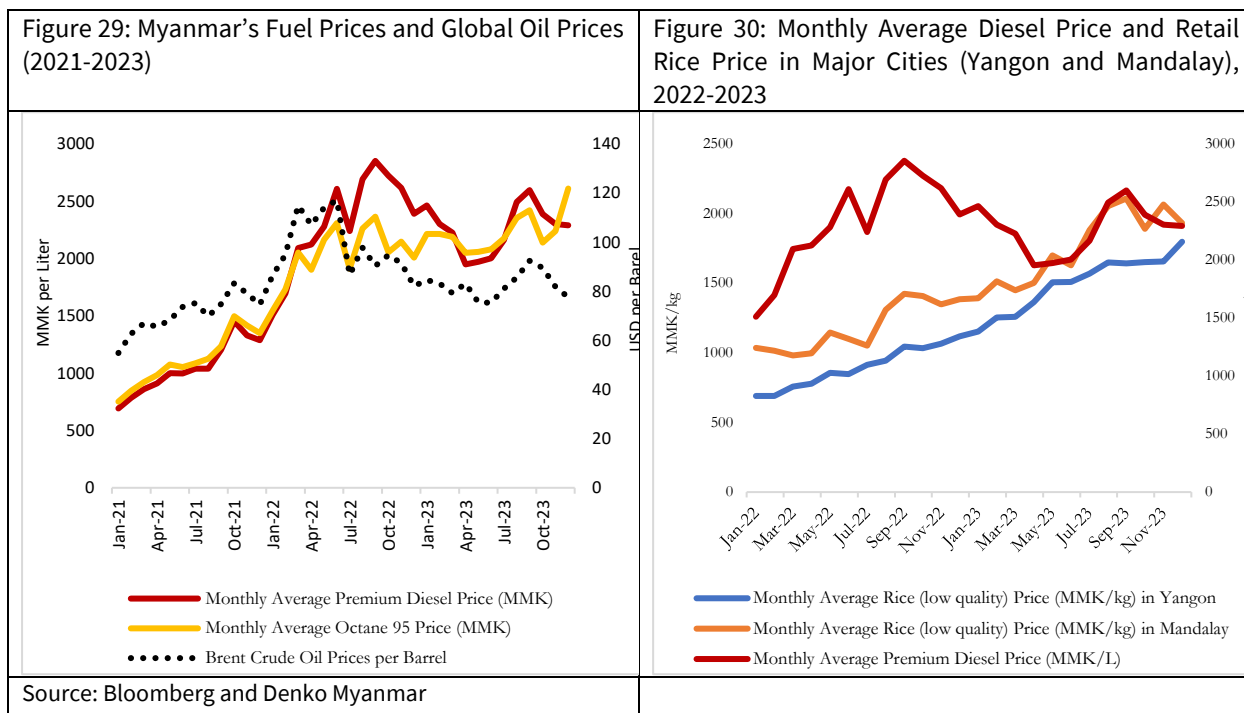
Source: The Customs Department of Thailand

Note: Prepared food, beverage and tobacco (HS section 4), minerals (HS section 5), machinery (HS section 16), chemicals (HS section 6), plastics and rubbers (HS section 7), textile and clothing (HS section 11), base metals (HS section 15) and transport equipment (HS section 17)

3. Transport Accessibility and Rising Fuel and Food Prices

Disruptions to supply chains have created a significant burden for transportation, logistics, and storage activities. These have helped to drive sharp rises in the retail prices of inputs, fuel, and certain food items. Given exchange rate depreciation, trade and logistics constraints, and supply shortages, retail price reference rates have become increasingly difficult to enforce.

Ever since 2022, escalating fuel prices (gasoline and diesel) have been a principal driver behind soaring transportation costs across Myanmar. The average price per liter for diesel and gasoline (Octane 95) has more than tripled from 2021 (Figure 29) due to the depreciating kyat and also following fluctuations in global crude oil prices. Since April 2022, domestic fuel prices have surged, and supply shortages have triggered severe spikes (ibid), as multiple exchange rate and import restrictions and government-mandated reference rates have distorted the market since that time (World Bank, 2023a; World Bank, 2024b).



Elevated and volatile fuel prices, especially diesel, are significant factors contributing to rising transportation costs, affecting prices of agricultural products countrywide. With a modal share of over 90 percent, freight movements over land rely heavily on trucking, a major consumer of diesel fuels. For Myanmar, due to its geographical characteristics and availability of infrastructure, sensitivity to fuel price increases is high. Most of the fuel needed is imported through Yangon ports, which requires transportation over land throughout the country, adding further pressure with elevated transportation costs. Diesel prices and retail rice prices in major cities such as Yangon and Mandalay appear to follow a similar trend (Figure 30).

Since February 2021, Myanmar's trucking sector is grappling with several other challenges besides fuel costs, according to a survey conducted in mid-2023¹². The survey results reveal that trucking companies are facing substantial impacts from heightened operating costs, prompting freight rates to climb by up to 80 percent in 2023 as compared to 2020. The most significant factor contributing to the spike in freight rates has been the sharp increase in fuel prices, notably in the years 2021 and 2022. Moreover, the rising expenses for vehicle parts, coupled with strict regulations on transport authorization and onerous permit requirements, are further affecting the efficiency and cost-effectiveness of domestic goods movement (Figures 31 and 32).

¹² The survey was conducted by the World Bank team in March-May 2023 and included a sample of 14 major trucking companies and 6 smaller companies providing cargo transportation services in Myanmar.

Figure 31: Trucking Freight Rates: Pricing Pressures (number of responses), 2021-2022

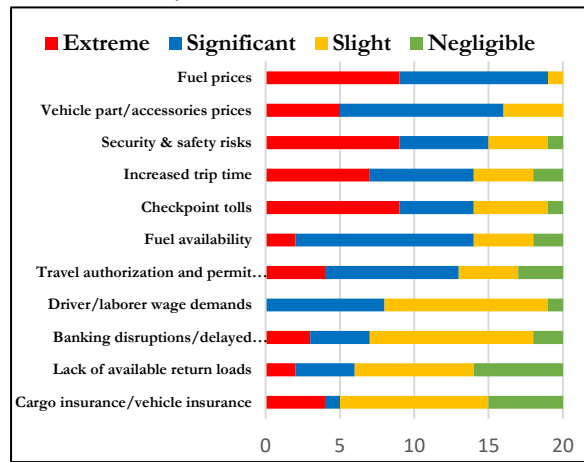
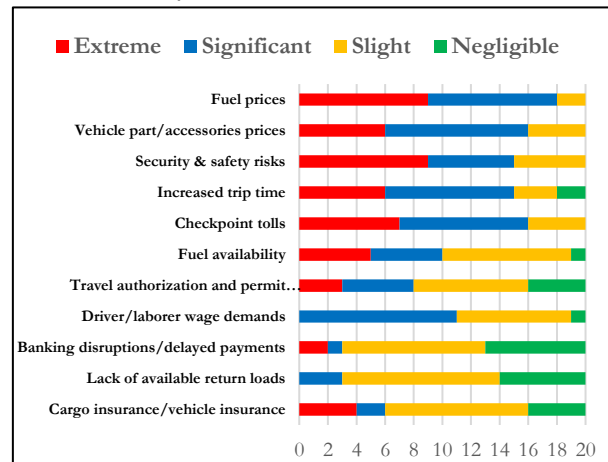


Figure 32: Trucking Freight Rates: Pricing Pressures (number of responses), Q1, 2023



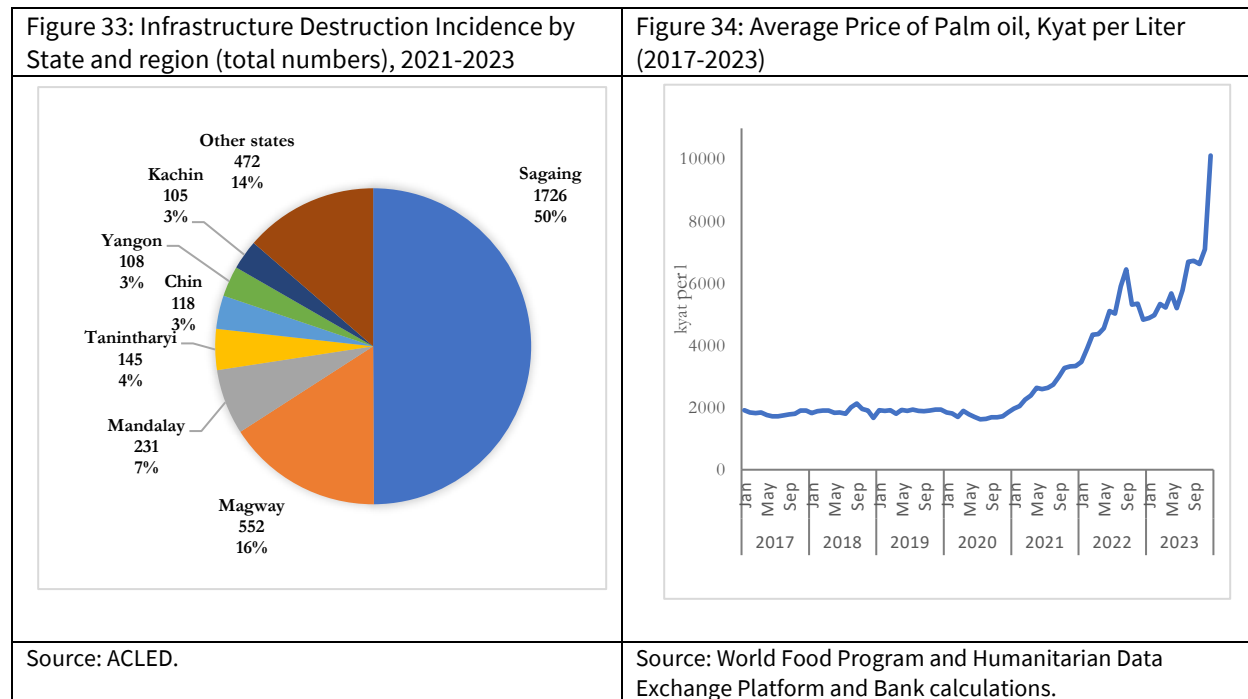
Source: World Bank.

Highway checkpoints, road closures, the need for travel authorization, restrictions in movements, and reduced trucking capacities are fueling transportation delays and rising costs. Trucking companies operating in conflict-affected regions such as along the Myawaddy border crossing with Thailand in Kayin state and the Muse crossing with China in northern Shan state are facing severe delays from conflicts along the corridors leading to the neighboring countries’ land borders. Given disruptions on some land borders with China, traders are diverting traffic to smaller trading posts that remain open for trade, including Lweje and Kampaiti. But constraints in handling capacity and infrastructure along those routes have resulted in overall trucking capacity, further impacting domestic freight rates.

Trucking firms have also reported a significant increase in the costs at road toll gates and checkpoint fees since the military takeover. While the official fees for bridges and highways have not changed, reports indicate a rise in unofficial payments to police, military personnel, and armed ethnic groups. Coupled with the overall increase in operating costs, this has led trucking companies to roughly double their freight rates on certain routes between 2020 and 2023. However, the instability of current operating conditions makes freight rates highly unpredictable, with unofficial tolls and checkpoint fees on some routes costing three to four times more than the official rates, according to the survey.

When consumers and firms face the burden of these price hikes, rising food insecurity can both be a cause and consequence of fragility, sometimes referred to as the “fragility trap” (World Bank, 2021b). Retail price data from the World Food Program and others, in combination with data on transport disruptions supplemented with information collected through interviews with relevant stakeholders, showcases supply chain inefficiencies and logistics constraints and their relationship with consumer prices, in particular rice, cooking (palm) oil, vegetables, and poultry across regions/towns/markets in the context of Myanmar.

The average price of common food staples locally produced (e.g., pulses) and imported (e.g., cooking oil) across administrative regions have risen exponentially (30-80 percent year-on-year). The average price of one kilogram of pulse (Appendix 1), for example, more than tripled over the period of January 2021 to January 2023. The sharpest inflation across all produce occurred in Rakhine state but is prevalent in most states and regions. According to data from ACLED, the greatest number of infrastructure destruction incidences, however, occurred in the dry zone (Sagaing, Mandalay, and Magway) as well as in the south (Tanintharyi) of the country (Figure 33).



The price inflation of imported food items like wheat flour and cooking oils is attributed to several factors, including elevated trade and transportation costs. Price levels were also underpinned by reduced availability due to lower-than-average imports since 2022, the country's limited import capacity, the kyat's significant depreciation, and a self-sufficiency policy. These prices are at record or near-record levels (see Appendix 1). Authorities have attempted to control food inflation by imposing price controls on staples like palm oil (Figure 34), but this led to nationwide shortages as importers and producers lacked market incentives.

Yangon, the commercial capital, experienced a consistent but slower price increase compared to other regions, not the least due to its geographic location and good transport accessibility. In the last quarter of 2023, Yangon saw a decrease in the prices of meat, fish, eggs, and cooking oil. A similar trend was observed in Northern Shan State for certain food categories. The Tanintharyi region saw a decline in cooking oil prices at the end of 2023 due to the availability of locally sourced palm oil. However, cereals and tubers prices have risen more gradually, with other commodities experiencing high volatility over the past three years.

The greatest price shocks were seen in imported commodities like cooking oil, especially in regions heavily impacted by conflict and transport accessibility restrictions. Rakhine, Chin, Kachin, North Shan, and Sagaing, saw the largest price increases for oils and fats. Pulses and nuts prices also rose significantly due to inflation, increased exports, and conflict. Vegetables and fruits followed seasonal patterns, but Rakhine state recorded an almost 200 percent price hike in late 2023 (Annex 2).

Rice exports from Myanmar surged in 2023, leading to a significant increase in export prices due to global demand despite higher transportation costs¹³. Domestic rice production has been affected by climatic events¹⁴, higher operating costs, and conflict-related issues. Short-term price control measures on rice had a limited impact on inflation. The retail price of the *emata* rice variety reached record levels from December 2023 to February 2024, with concerns for future crop seasons due to rising input prices, transportation costs, and currency policy changes.

The edible oils sector¹⁵, particularly palm oil, transported over long distances, has seen similar patterns of short-lived interventions¹⁶ with limited success in curbing price increases. Myanmar's reliance on imported palm oil, along with global price rises, currency depreciation, and restrictive import policies, has led to severe shortages and price spikes, with retail prices increasing by 203 percent since 2021 and affecting consumer purchases and overall trade.

Price controls and restrictions, exchange rate fluctuations, and increased agricultural exports, in conjunction with reduced agricultural production, are the primary drivers of food insecurity in Myanmar. Among all farmers, a significant proportion - 24 percent of those in conflict-affected areas and 14 percent in unaffected regions - have decreased their cultivated land areas. Simultaneously, the impact of natural disasters has heightened these challenges. A staggering 71 percent of farmers affected by Cyclone Mocha in May 2023 report facing production difficulties, while even among those unaffected by natural hazards, 54 percent experience impediments to production (UNOCHA, 2023).

¹³ In 2023, the export price of Myanmar's rice surged to almost 600 USD per metric ton. The international price of rice has been surging in the second half of 2023 due to lower-than-expected outputs and export restrictions imposed by some producing countries (notably India imposed an export ban on non-basmati white rice varieties to meet domestic needs).

¹⁴ According to an assessment and survey of food traders and input retailers conducted by the FAO and WFP (FAO and WFP, 2022), this is due to several domestic factors that have impacted rice production in the recent years, including climatic disruptions (Cyclone Mocha in 2023), higher operating costs (imported fertilizers and transportation costs) as well as conflict related issues (infrastructure destruction and contaminated land)

¹⁵ With annual cooking oil consumption exceeding 1 million tons and a small domestic production (about 400,000 tons), Myanmar heavily relies on imported palm oil (around 800,000 tonnes annually) from Malaysia and Indonesia.

¹⁶ Temporary restrictions introduced included: (i) a 45-day moratorium on issuing new rice export licenses at the end of August 2023, though existing license holders could continue exporting, and (ii) capping the paddy rice selling price by farmers to negotiate with dealers at 2 million kyats per 100 baskets for the 2023 monsoon harvest season. According to the Myanmar Rice Federation, the reference price aimed to ensure reasonable profits for farmers, stabilize rice prices, and ease the financial burden on consumers.

Displacement, restrictions on mobility, and limited accessibility are compounding factors contributing to rising food insecurity. By December 2023, almost 2.6 million people have been displaced, with the largest share occurring near borders. This has triggered new regional dynamics with significant interruptions to formal trade and the availability of imported goods. Communications have been shut down in regions that were previously unaffected, resulting in the blockage, restriction, or slowing down of the mobility of people and freight movements along key commercial and humanitarian transport routes. There remain strict controls and limits to the transportation of rice, fuel and fertilizers, undermining access of the population to staple commodities and testing the resilience of communities.

When measuring the relatedness of various factors (such as conflict, geographical location, transportation, and accessibility) with price inflation, transport accessibility seems to be the most significant factor. The highest reported levels of food price inflation are observed in states with the highest proportion of territory classified as being the most difficult to access (Chin, Rakhine, Sagaing, North Shan) (Table 1). Inflation rates were also the highest for imported food categories, such as cooking oil (imported palm oil), vegetables and fruits (mixed sourcing types) as well as pulses and nuts. Among the main categories of staple commodities, price hikes of cereals and tubers appear to be the least associated with any measure of accessibility, conflict, and land coverage type.

Cooking oil (oils and fats) price increases have been found to be positively and strongly associated with transport accessibility indicators, specifically with increases in the average elevation level of the state (Pearson’s coefficient is 0.83) as well as with a larger share of state’s territory categorized as the “Hardest -Type C” accessibility type land (Pearson’s coefficient is 0.65). The territories that are the most difficult to access also tend to be located at higher elevations and further away from main cities and state centers, and, in some cases, closer to the land borders with neighboring countries. Accessibility constraints may also be influenced by higher transportation costs, which are already elevated nationwide.

Table 1: Annual Percent Change in Prices of Food Categories

Pearson’s correlation coefficient (p-value in parentheses)	cereals and tubers	meat, fish, and eggs	miscellaneous food	oil and fats	pulses and nuts	vegetables and fruits
Access: Moderate-Type A (% of state area)	0.42 (0.15)	0.04 (0.90)	0.15 (0.63)	-0.08 (0.79)	0.01 (0.98)	-0.29 (0.34)
Access: Harder-Type B (% of state area)	0.16 (0.60)	0.15 (0.63)	0.04 (0.89)	0.07 (0.81)	-0.09 (0.77)	0.07 (0.82)
Access: Hardest-Type C (% of state area)	0.35 (0.25)	0.55 (0.05)	-0.08 (0.80)	0.70 (0.01)**	0.20 (0.51)	0.72 (0.01)**
Travel time (mins) to nearest city (50,000+)	0.46 (0.11)	0.48 (0.10)	0.41 (0.16)	0.30 (0.32)	0.66 (0.01)*	0.60 (0.03)*

Distance to main roads (max)	-0.12 (0.70)	-0.13 (0.67)	0.53 (0.06)	-0.40 (0.18)	-0.00 (1.00)	-0.01 (0.96)
Distance to main roads (mean)	0.35 (0.24)	0.24 (0.43)	0.73 (0.00)**	-0.18 (0.56)	0.57 (0.04)*	0.43 (0.14)
Distance to coast (mean)	-0.22 (0.46)	0.04 (0.90)	-0.50 (0.08)	0.49 (0.09)	0.16 (0.60)	-0.06 (0.84)
Landscan global population (2021)	-0.44 (0.13)	-0.30 (0.32)	-0.01 (0.98)	-0.31 (0.30)	-0.24 (0.44)	-0.44 (0.14)
Conflict: # dead (% Δ 2022-23)	-0.21 (0.50)	0.07 (0.82)	-0.25 (0.40)	0.37 (0.21)	0.08 (0.81)	-0.02 (0.95)
Conflict: #infr damage events (% Δ 2022-23)	0.31 (0.30)	0.28 (0.36)	0.44 (0.13)	-0.00 (1.00)	0.39 (0.18)	0.08 (0.78)
SRTM elevation at 500 m (mean)	-0.00 (1.00)	0.12 (0.69)	-0.46 (0.11)	0.62 (0.02)*	-0.00 (0.99)	0.17 (0.58)

** p -value ≤ 0.01 * p -value ≤ 0.05

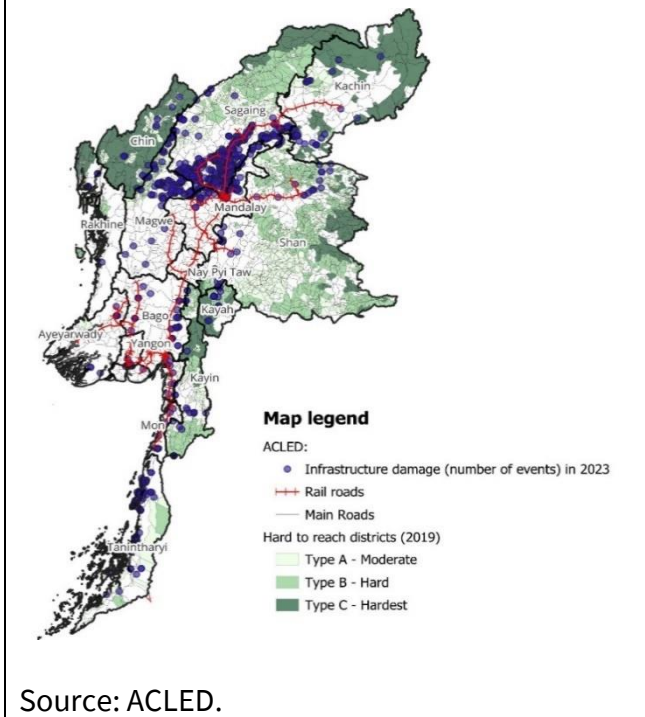
Source: Bank estimates based on World Food Program Price data.

Notes: The table provides an exploratory overview of dependency between annual price changes for aggregate product categories (first row, World Food Program datasets) in Myanmar's districts and an array of transportation-, accessibility-, infrastructure- and conflict - related variables within the same districts (first column). The dependency is measured using Pearson's correlation coefficient, a standardized metric that ranges between -1 and 1. Any two values that are strongly positively related to each other will indicate positive correlation coefficient above 0.5. Values will have a negative correlation coefficient below -0.5 if two variables are strongly negatively associated with each other. Correlation coefficient between -0.5 and 0.5 have mild and weak associations, where 0 indicates no correlation between them. The following data sources were used to generate the variables from the table: two conflict -related indicators are a result of computations using ACLED conflict dataset; hard to reach communities at village and town levels classification was generated by data from the Ministry of Planning and Finance and disseminated by Myanmar's Information Management unit (MIMU) in May 2019. Population counts were sourced from CIESIN; slope and elevation data - from NASA; and access to infrastructure indicators (distance to Coast, Distances to Roads, Distance to country borders and Travel Time to Major Cities) were sourced from GSHHG, CIESIB, GADM and JRC, respectively. References to each data sources are available in Bibliography section.

Northern Shan and Northern parts of the country (Kachin, Chin, and Sagaing)¹⁷ are particularly affected, as they are hard to access due to elevation or conflict that has been escalating and spilling over from neighboring land areas. The share of a state's land surface with difficult terrain is also associated with rising prices of vegetables and fruits. A mildly strong association of 0.75 correlation was identified between the prices of pulses and nuts and the estimated travel time to the nearest city of 50,000 or more people. Distance to the coast was associated the most with prices of cooking oil - likely due to these products being primarily imported with a relatively small domestic production (usually of lesser quality and higher costs). Proximity to roads, measured as the average travel distance to roads was another factor that was positively associated with price changes of pulses and nuts (0.59) as well as of miscellaneous food categories (0.72).

¹⁷ These regions are classified as accessibility category type C and visible in the panels on Map 1.

Map 1: Myanmar Railway Network, Conflict and Accessibility



Source: ACLED.

Conflict escalation at sourcing locations or hubs for food shipments appears to be a major cause of spiraling food inflation in destination regions. Map 1 represents the main railroad network of Myanmar, with a spread and reach that is equivalent to the overall domestic transport function. It visualizes how the transport network and channels connecting remote and hard-to-access regions were disrupted at the source level in the regions that are generally accessible. Many infrastructure destructions happened in the central dry zone region and south of Yangon, which interrupted the flow of goods to the regions that have always been in harder-to-reach areas.

Notwithstanding, fragility has intensified as transport barriers along key trade routes have impaired access to basic

goods, services, and humanitarian aid delivery in some areas. The correlation coefficient presents additional variables that were tested for the association with inflation rates of different categories. Population size was also poorly associated with food price increases. Finally, the correlation analysis didn't reveal any strong association between inflation rates in any of the food categories and conflict related factors within a state, proxied by the following measures: Pearson's coefficient values for percent change in infrastructure destruction events between 2022 and 2023 and the percent change in the number of casualties. Correlation coefficients ranged between -0.2 and 0.4 values, suggesting that, within each region, food inflation is not strongly associated with the severity of infrastructural damage due to ongoing conflict.

Even though there seems to be little connection between the conflict inside a state and food price inflation in that state (Figure 33), it is essential to keep in mind the dynamic spatial structure of the food supply and distribution channels in Myanmar. Appendix 2 illustrates a key finding that can be missed when using simple correlation values. Quite often, food shipments, whether domestic (coming from millers or processing facilities located in Yangon and surrounding areas) or imported (transiting from Yangon's ports) move from these source areas north to Mandalay region and the Dry Zone, from which the supplies are spread out radially to North, East and West of the country (to elevated and remote areas further away from the center).

4. Conclusion and Outlook

The report's analysis, which utilizes novel, high-frequency data, underscores the **adaptability of Myanmar's freight transportation and logistics industry**, with a particular focus on its maritime shipping sector. Nevertheless, transport services as derived demand are not shielded from factors outside the control of the sector that are the main catalysts for disruptions in both domestic and international trade flows. Accordingly, the report concludes with four takeaways:

1. **Despite increasing challenges, the maritime freight transportation and logistics industry managed to maintain a level of resilience, albeit with significant cost increases.** This is not the least due to the industry's core role in facilitating the movement of products, connecting suppliers with consumers, and enabling businesses to operate. Over 2020-2023, shipping capacity offered for containerized goods has been relatively steady at about 800,000 containers (twenty-foot equivalent units, TEUs) per annum (2021 experienced a drop, Figure 11), with ships spending on average around 2 to 2.5 days in Yangon's ports during a port call. With constant container handling performance and berth utilization rate, Yangon's ports, which handle the majority of Myanmar's international trade have demonstrated to be relatively resilient.
2. **Disruptions affecting domestic and international shipping, as well as ancillary transport and logistics operations are mostly driven by factors that are outside of the control of individual firms.** Contributing factors include increased fuel and replacement costs, restricted access to foreign currency, stringent foreign exchange transaction regulations, extended lead times for outbound payments, security concerns, and additional hurdles encountered along transport corridors (World Bank, 2024b). The trucking sector survey revealed that the rise in fuel prices directly impacted operational costs, prompting freight rates to climb by up to 80 percent in 2023 as compared to 2020¹⁸. Fuel prices may also be affected by increased waiting and discharge time of tankers at Yangon's ports (up to 8 days in October 2023) given the shortage of foreign currency.
3. **These disruptions have prompted a shift toward informal trade and transport networks.** Informal (or underreported) trade and transportation of goods through land borders appears to be on the rise: the gap between Myanmar's reported trade with its neighbors is widening based on mirror data analysis. While Myanmar's reporting and Thailand's mirror trade data follow the same trend, the gap between Myanmar's recorded imports from Thailand and Thailand's recorded exports to Myanmar is about USD 200 million in November 2023. Those trends seem to reflect the tightening licensing procedures for official and formal trade, making it extremely difficult for

¹⁸ Prices vary widely between routes and are impacted by a range of factors, including commodity type, level of competition, demand, road conditions, season, travel time, security and operating costs, including official and unofficial toll land checkpoint payments.

businesses to bring in vital consumer goods, manufacturing inputs, and machinery through official channels.

4. **Limited transport accessibility, particularly to remote areas often located along corridors in conflict zones, is contributing to price increases of essential goods.** The challenges of remoteness and transportation barriers, such as checkpoints, road closures, and the need for travel permits, exacerbate the situation by causing shipment delays and cost increases. The correlation analysis presented reveals that the highest reported levels of food price inflation are observed in states with low levels of transport accessibility (Chin, Rakhine, Sagaing, North Shan). Cooking oil price increases have been found to be positively and strongly associated with transport accessibility indicators (Pearson's coefficient of 0.83). Accessibility constraints, in combination with government-imposed price controls and restrictions, as well as weakened agricultural output, contribute to food inflation and insecurity.

The transportation and logistics sector will continue to face challenges, potentially impacting connectivity and demand patterns in the medium term. Since 2021, the country has been affected by supply chain disruptions, thickened borders, and food insecurity. Despite showing some resilience, the transportation and logistics industries face the burden of escalating operational costs. The stagnation in seaborne trade and the rise of informal trade, in combination with conflict-related uncertainties, may impact connectivity and demand patterns for transportation and logistics services in Myanmar:

- Since the demand for freight transportation and logistics services is derived, it is intrinsically linked to economic activities, including import and export volumes. Myanmar's seaborne trade has declined with containerized imports and exports in January 2022 and 2023 accounting for 66 percent and 61 percent of the volumes seen in January 2020. The drastic decline of laden import containers (from 55,000 TEUs in January 2020 to 25,000 TEUs in November 2023) has resulted in the need to import empty containers, mainly used for agricultural exports, which increased threefold in 2023 as compared to 2019. A further reduction in trade is expected to lead to diminished maritime shipping connectivity over the medium term.
- Based on interviews with industry experts, international shippers are already adapting their strategies by moving from ocean freight to intermodal transport, incorporating strategic warehousing. This has introduced new complexities into established trade flows. Meanwhile, import restrictions and the inclination towards product substitution have nudged the demand for supplies and goods towards informal cross-border trade.

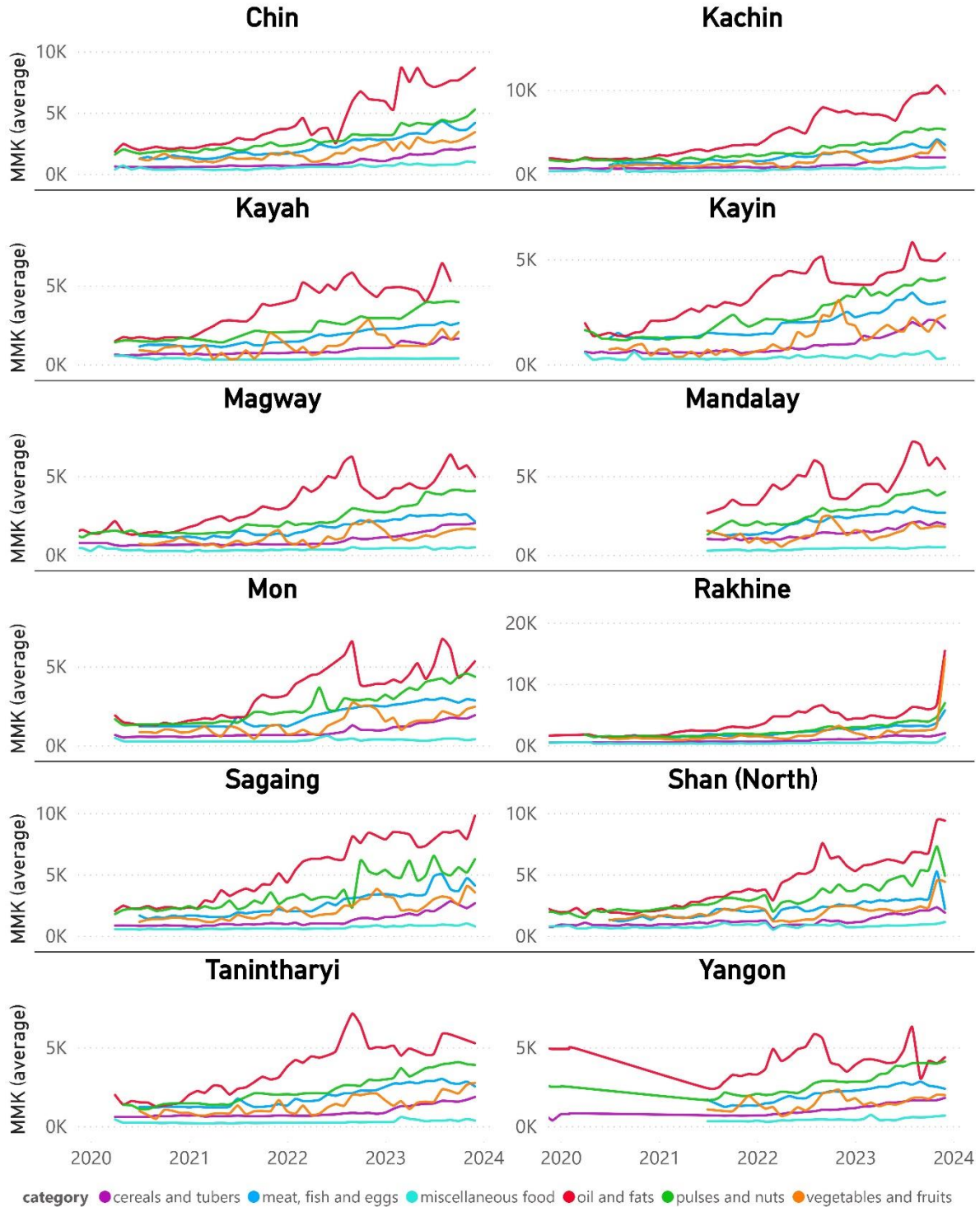
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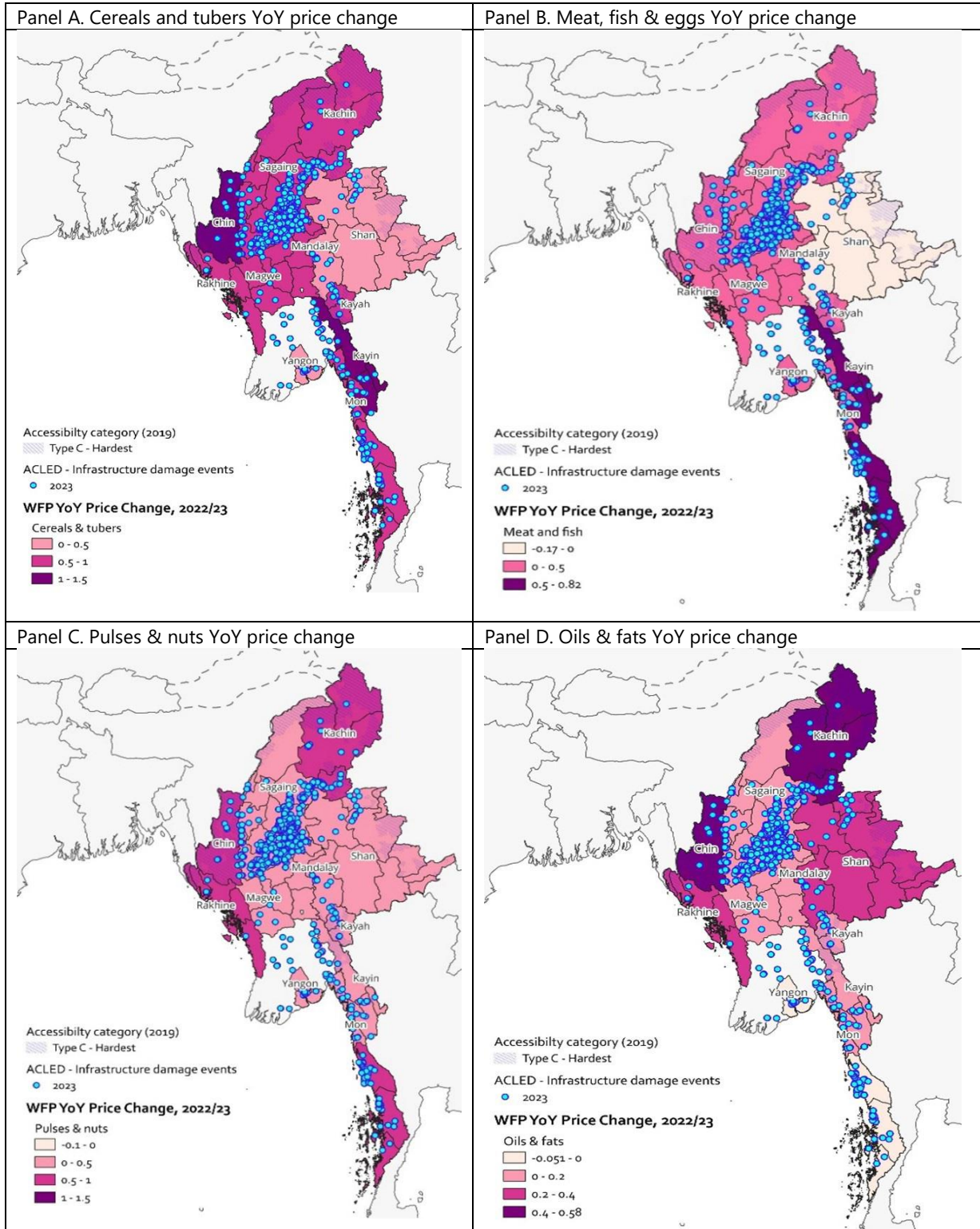
Appendix 1. Monthly Average Price of Staple Food Commodities by Region (2020-2023)

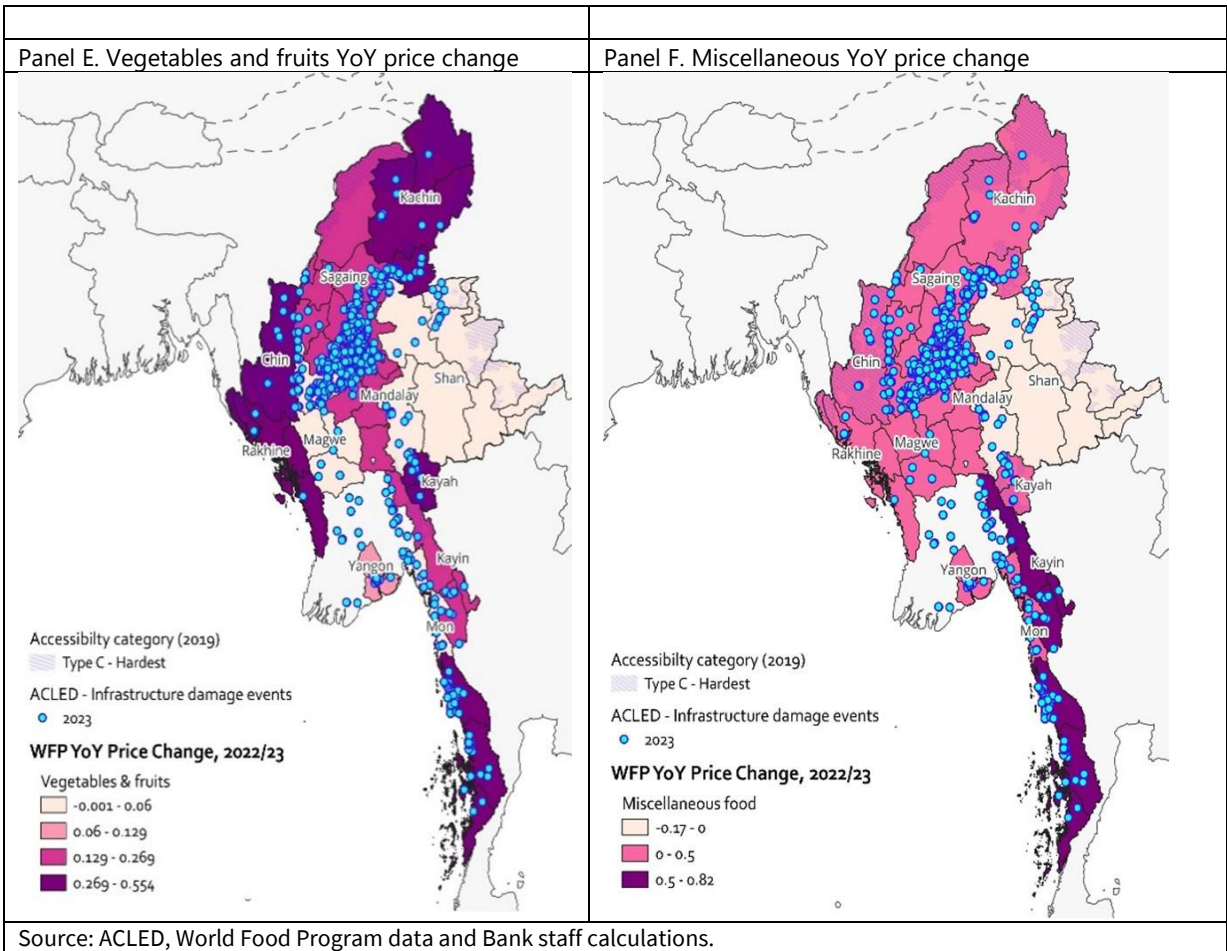
Monthly average price of staple food commodities by regions, Myanmar (2020-23)



Source: Humanitarian Data Exchange Platform and World Food Program and Bank staff calculations.

Appendix 2. Relatedness of Regional Accessibility, Conflict-Induced Infrastructure Damage, and Spatial Variability of Food Price Inflation of Staple Commodities







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