

## APPLYING SYSTEM MAPPING TECHNIQUES TO UNDERSTAND SHOCKS COVID-19 UPDATE REPORT 1 (JUNE 2020)

### Executive Summary

The preventative measures imposed by the Government of Uganda to curb the spread of COVID-19 are likely to have an impact on various components of the agricultural market system, which could aggregate into broader systemic effects. The Market System Monitoring team is conducting an analysis of the agricultural market system to anticipate the impact of COVID-19 and these preventative measures. This first assessment is based on our previous knowledge of the system, as well as consultations with a few key stakeholders. We will be updating our analysis as we gather more information and as the situation changes.

Based on Step 1 of our Rapid System Assessment, we hypothesize that key impacts on the system will be:

1. **Agricultural inputs:** Importers and retailers will be negatively impacted by delays at the border and restrictions on transportation. Given the shock is occurring between planting seasons, it is likely that the impact will be relatively isolated, unless the restrictions persist through the end of summer 2020.
2. **Commodity distribution:** The closures of certain border points and the imposition of COVID-19 testing for cargo vehicle drivers will negatively impact businesses involved in the transportation and wholesaling of commodities. Increased transportation costs will combine with restricted access to markets to have a ripple effect on prices throughout the supply chain.. The performance of the Ugandan shilling over the next few months may also have a significant impact on export volumes.
3. **Farm households:** Given the shock is occurring between the main planting seasons, we expect most smallholder farmers will be insulated from the impacts on the agricultural supply chain. However, many households rely on non-farm income, and currently have limited access to markets and other essential services. The full magnitude of the impact on rural households will depend on whether the restrictions persist through the end of summer 2020, when preparations for the next season begin.
4. **Access to finance:** We expect supply chain actors will have more limited access to financial services, given both practical issues with access and a likely increase in credit rationing as financial institutions re-evaluate the risk in their portfolios. Should banks face a large number of defaults and/or further depreciation of the shilling against the dollar, credit availability could contract further.

Over the next few months, our team will publish more update reports focusing on particular aspects of the agricultural market system. These hypotheses will be updated as new information becomes available, and are dependent on the course of the virus and the duration of the current set of preventative measures.

### Methodology

The USAID/Uganda Feed the Future Market System Monitoring team is conducting a Rapid System Assessment of the agricultural market system in Uganda, in order to anticipate the likely impacts of both COVID-19 and the preventative measures implemented by the Government of Uganda beginning in March 2020. We will be focusing our analysis on a few key subsystems, which we discuss in detail below. These represent the parts of the system that are most closely linked to USAID's current market system development programming in Uganda, which has been the focus of our previous work. Our objective is to inform USAID's response to the situation and provide guidance on which parts of the system should be monitored going forward.



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This report presents the results of Step 1 of our Rapid System Assessment, and is based on consultations with a few key stakeholders and our team's existing knowledge of the agricultural market system, as well as a reasonable familiarity with current events. The objective of this first stage was to quickly develop hypotheses based on our knowledge of the system and how we would expect shocks to propagate through this system. We limited our outreach to key stakeholders at USAID, which allowed us to rapidly create an initial mental framework for interpreting the impact of COVID-19. The exercise also informs our strategy for further information gathering, including Key Informant Interviews, by highlighting which parts of the system are likely to be most severely impacted.

We will be using the Uganda Agricultural Market System Map as an essential tool in our analysis. This map was created by our team and the version with our COVID-19 overlay is available to view on the Kumu platform at <https://kumu.io/MSM/usaaid-uganda-fft-m-sm-activity-covid-19-map#full-map/shock-status>. The system map allows us to identify how a shock is propagated through the system, where we anticipate the shock will have an effect, and through what mechanism this effect will occur.

- For a guide to interpreting the system map images in this document and using the Kumu platform, please consult <https://humanitarian.mit.edu/rapid-system-assessment-methodology-kumu-example/>.
- For more on our Rapid System Assessment methodology, please visit <https://humanitarian.mit.edu/rapid-system-assessment-methodology>.

The insights presented here represent our best understanding of the anticipated impacts on the market system. This analysis will be updated as we collect and process new information. Please contact our team at [msm.uganda@mit.edu](mailto:msm.uganda@mit.edu) with any questions or feedback.

## Representing the impact of COVID-19 on the market system

To conduct this analysis, we conceptualized COVID-19 and the government's preventative measures as shocks to the system. At this stage, the number of COVID-19 cases has been low, and should remain low if the preventative measures are effective. As such, we focus on the larger macroeconomic effects of the global pandemic, such as the impact on the Ugandan currency and demand for exports from abroad. If the number of cases begins to rise, we will add the virus itself as a shock; at present, it is more of an economic shock than a health shock in Uganda. The government's preventative measures, including the closure of nonessential businesses and a ban on public and most private transportation, are also likely to have significant economic implications. They form the majority of the shocks to the system that we have considered for this analysis.

The shocks that we considered, as well as the second- and third-order shock effects they generate as they travel through the system, are listed in the table below. These shocks and shock effects were layered onto our system map as new elements, as you can see on the web version and in the images below.

First-order shocks	Second- and third-order shock effects
Non-essential businesses are closed	Average urban household income reduces Tax revenues fall Government service provision is disrupted



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Public and most private transport is suspended	<ul style="list-style-type: none"> <li>Reduced access to markets</li> <li>Labor mobility is reduced</li> <li>Mobile money and bank agents have limited liquidity</li> <li>Transport delays occur distributing inputs</li> <li>Input retailers cannot access farmers</li> <li>Extension service providers cannot access farmers</li> <li>Transport delays occur collecting outputs</li> <li>Post-harvest losses increase</li> <li>Tax revenues fall</li> <li>Government service provision is disrupted</li> </ul>
Gatherings banned	<ul style="list-style-type: none"> <li>Reduced access to markets</li> <li>No trainings or information sessions</li> </ul>
Curfew imposed	<ul style="list-style-type: none"> <li>Transportation costs increase</li> <li>Transport delays occur collecting outputs</li> </ul>
International travel restrictions are imposed	<ul style="list-style-type: none"> <li>Price of imported food products increases</li> <li>Traders face delays at borders</li> <li>Cross-border trade limited to cargo vehicles</li> <li>Significant delays for imported products</li> <li>Transportation costs increase</li> <li>Demand for certain export commodities is reduced</li> <li>Overseas buyers cannot visit producers</li> <li>Tax revenues fall</li> <li>Government service provision is disrupted</li> </ul>
Currency depreciates	<ul style="list-style-type: none"> <li>Cost of imports increases</li> <li>Price of imported food products increases</li> <li>Competitiveness of exports increases</li> </ul>
Other countries apply food export restrictions	<ul style="list-style-type: none"> <li>Food prices increase</li> </ul>
International remittances are reduced	-
Schools shut down	School feeding halted
Food rations cut for refugees	-

We then traced the paths each shock could travel through the system, and hypothesized the likely impact of the shocks on the system elements in the four key subsystems we discuss below. Each element was color-coded to represent its status. We have provided a legend below for reference, but we encourage you to review our guide to interpreting the map for a more thorough explanation of what each shape and color represents: <https://humanitarian.mit.edu/rapid-system-assessment-methodology-kumu-example/>.



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### Legend

- Shock Status: Impacted to point of being non-functional
- Shock Status: Significantly impacted
- Shock Status: Somewhat impacted
- Shock Status: Not impacted
- Shock Status: Improved
- Shock Status: Impact unknown

## Agricultural Inputs

Overall, we expect that this segment of the supply chain will be negatively impacted, though not severely unless pandemic conditions persist. The main periods for purchasing agricultural inputs occur before the two growing seasons, in February-March and August-September. It is likely that the majority of inputs for the first planting season were already purchased before the restrictions were imposed. Nevertheless, the inputs sector will still see a decline in normal business for this time of year, particularly from commercial agribusinesses that rely on export markets, and higher costs. The true impact on the sector will depend on the underlying business fundamentals of the importers, manufacturers, wholesalers, and dealers, and their ability to absorb rising costs and reduced demand.

### Importers, Wholesalers, and Distributors

As seen on the map below, the main shocks to this portion of the system are the restrictions on international trade, currency depreciation, the closure of non-essential businesses, and restrictions on movement.

The majority of Uganda's inputs are imported, particularly agrochemicals. We expect to see increased costs for imported products, as a result of currency depreciation, which may be passed on to consumers. There are indications that the Ugandan shilling may continue to depreciate against the dollar, though not necessarily compared to the currencies of regional trading partners, so the impact will depend on the source of the products.

Border delays will further increase the cost of imported goods. Businesses across all supply chains will face higher transportation costs as carriers increase rates due to delays and restrictions on movement. Though cargo vehicles are exempt, some businesses may require movement permits for other types of vehicles and may face difficulties with staff movement and distribution of products. The curfew also restricts the transport window for cargo vehicles, which could cause additional delays.

As seen below, we expect to see an impact on these businesses' ability to stock agricultural inputs, which will in turn impact their ability to earn a profit. This impact could be lessened through access to short-term liquidity, though we anticipate these businesses will have difficulty accessing finance, given the general disruption to business operations and restrictions on physical access. It is also possible that financial institutions will reduce the amount they are lending during this period as they re-evaluate the level of risk in their portfolios and wait to see how their outstanding loans perform.

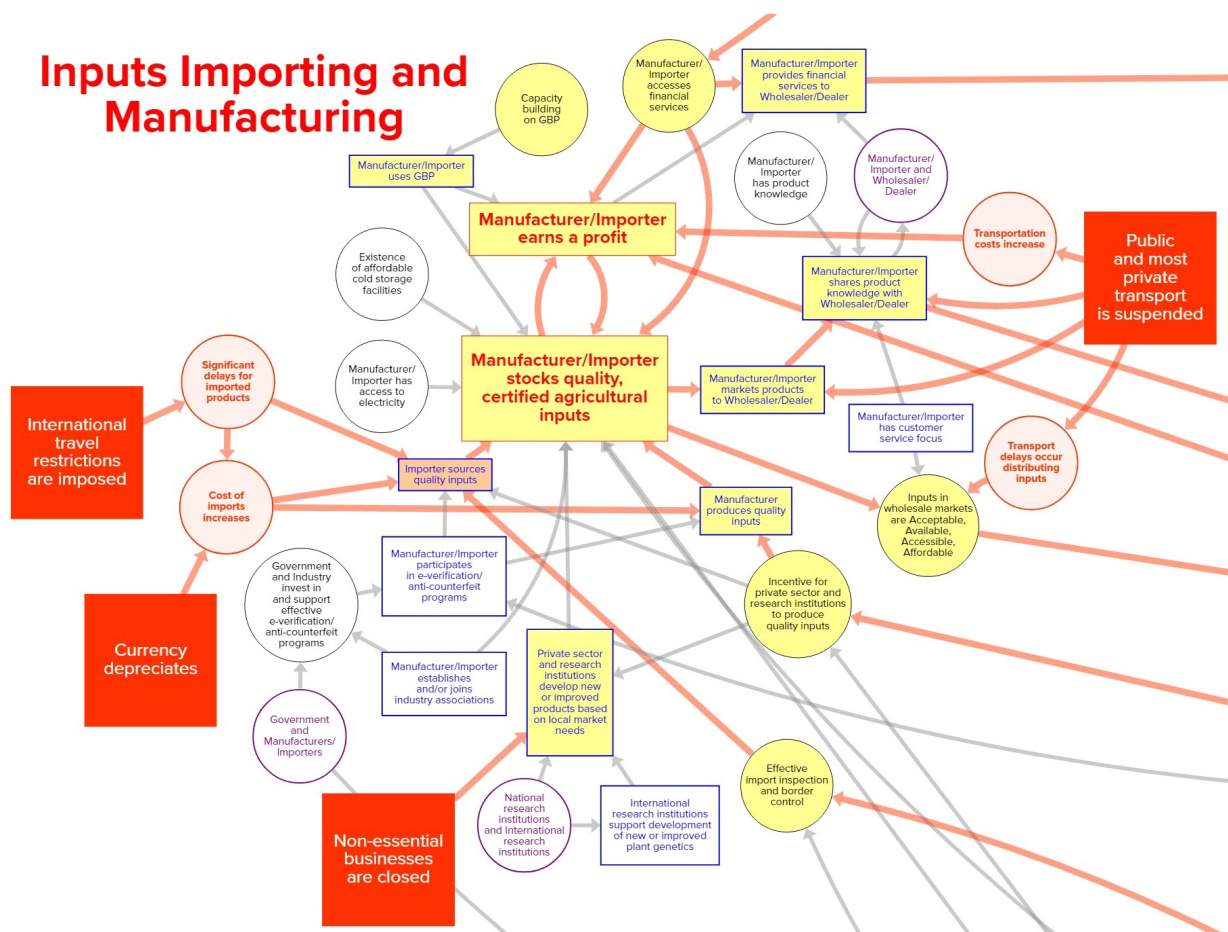
Finally, the development of new products will also be halted if agricultural research stations remain closed, which will have long term effects. Inspection of products at the border may also be impacted if resources are



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diverted to testing and tracing, which could lead to more counterfeit products on the market. The impact on regulatory enforcement will depend on the impact on the government's budget as resources are reallocated to COVID-related services and tax revenues decline due to decreased economic activity.



### Input Retailers

We expect a negative impact on agricultural input dealers as well. As seen on the map below, we also anticipate that their ability to stock agricultural inputs will be somewhat impacted, which will also negatively impact their profitability. Many of the effects seen in this subsystem are impacts we expect will travel downstream from importers and wholesalers.

Though agricultural businesses are considered essential and exempt from the closures, many of their customers will be unable to reach the shops due to the closure of public transportation. This shock is represented below on the right. Business owners themselves may also have difficulty reaching and operating their businesses as a result, including any outreach through village agents, cooperatives, or other sales channels requiring face-to-face interaction. Any trainings or information sessions typically conducted by either suppliers or agrodealers are unable to take place as well, as a result of the ban on gatherings.

The costs of products may increase if the higher logistics and transportation costs are passed on by importers and manufacturers, as we anticipate. These businesses are also less likely to receive inventory financing from suppliers or wholesalers this year, given the challenges faced by upstream businesses. They will have similar



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difficulties accessing financial services, given the restrictions on movement and an anticipated reduction in lending. However, many agrodealers already experience lower sales volumes from April-July, which may insulate them from some of the impacts.

If the shocks persist through the summer, as agrodealers begin stocking for the next season, we may see lower volumes and decreased product availability. Some agrodealers will not be able to withstand the decrease in demand, suffer income losses from other businesses, or rely on credit from their suppliers, and will not be able to purchase the same volume and portfolio of products. We may also see a trend towards cheaper products, or perhaps an uptick in counterfeits, as these dealers will also likely face decreased demand and higher price sensitivity from farmers, as discussed below.



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### Commodity Distribution

We also expect to see negative impacts on the commodity distribution segment of the supply chain - encompassing wholesalers, transporters, and distributors. As this shock is occurring between the two annual harvests, the impact on commodity dealers will not be as great as it could have been. However, given how heavily this sector depends on transportation and access to export markets, we expect that the impact will be significant. As with the inputs sector, this portion of the supply chain could see more bankruptcies in the next year, if businesses are unable to weather the increased operating costs and disruptions to their businesses. Under the current circumstances, it is a benefit that Uganda's commodity market is quite decentralized, as the sector is less vulnerable to disruption than more concentrated markets with a few large players.

As with the inputs sector, businesses dealing in commodities will face higher transportation costs. These businesses are also considered essential and the movement of cargo vehicles is permitted, but all other types of staff movement will be disrupted and overall transportation costs will increase due to the curfew and lack of public transportation. Smaller businesses will be particularly vulnerable to these cost increases as they are more likely to rely on smaller vehicles, public transportation, and third-party service providers such as processors. In general, commodity businesses will be less likely to provide extra services to their suppliers, such as advance payments, trainings, or inputs on credit, given the negative impact on their bottom line. The impact on the market for higher-grade commodities is less certain, as is the prospect for specialty commodities such as coffee.

The commodity businesses that engage in export will be significantly negatively impacted by the COVID-19 restrictions. The border restrictions, depicted in the upper right corner on the map below, will significantly impact this sector. As discussed above, there have been substantial delays at the border, which are increasing logistics costs and impacting planning and operations. USAID has received reports that some exporters are no longer receiving trade financing, since overseas buyers cannot conduct visits or audits, and orders have reduced as well. Over the medium-term, the impact on these businesses will depend on both the persistence of delays at the borders and the macroeconomic impacts on Uganda's major trading partners.

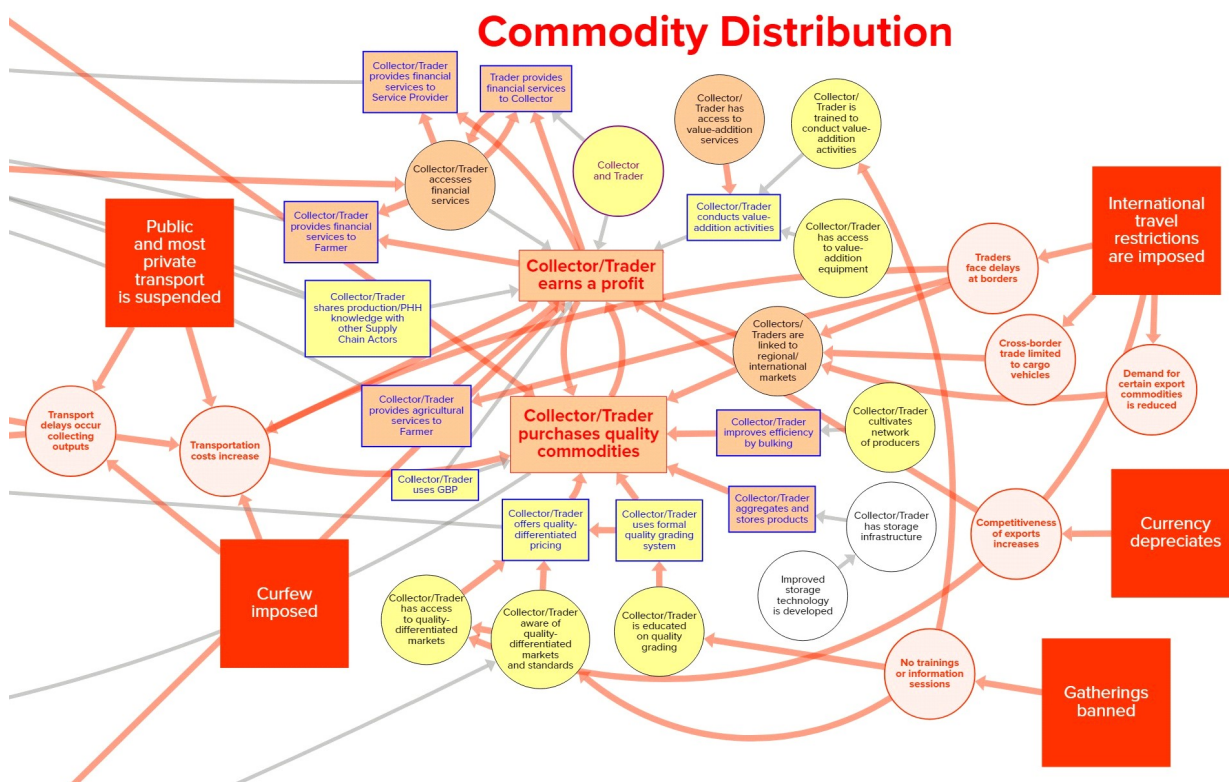
We also expect to see a significant negative impact on agricultural processing and food distribution businesses. Though not represented on the map below, they are also likely to experience higher transportation costs, and may have difficulties maintaining operations if their employees do not have access to private transportation. We expect to see many households cut back on consumption of processed foods to reduce food expenditures, which will further impact these businesses. Currency depreciation could also negatively impact processors and other service providers who rely on imported parts or raw materials. Many of these businesses are highly indebted, and may struggle to stay afloat and/or access additional credit.

The overall impact on the sector will depend on a few key factors. First, the number of businesses that rely on exports for the majority of their business will determine how serious the impact will be. Second, the level of domestic commodity stocks and the performance of the June-July harvest will impact how much domestic and international business takes place. Third, these businesses' ability to reach farms (and/or farmer's ability to reach market centers), and farmers' willingness to sell during a period of uncertainty, will impact domestic supplies. Finally, some businesses in this sector are particularly sensitive to currency depreciation, which could further impact the shilling if export revenues decline as a result. This may also make it more difficult to secure financing, as the financial institutions are also sensitive to currency movements.

All of these factors, plus the performance of the shilling, will combine to determine the prices of staple commodities and cash crops over the next few months. Though food prices increased at the beginning of this situation, the spike appeared to be short-lived; it is difficult to anticipate what the full impact on prices will be.



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## Farm Households

Finally, we analyzed the impact these shocks will have on farmers' ability to engage in agricultural production. The majority of Ugandan farmers are engaged in subsistence production, but many do sell a portion of their harvest. As mentioned above, these shocks are hitting between Uganda's two main growing seasons, which should limit some of the damage.

We anticipate that the overall impact on agricultural income will be minimal, though those households that were planning to sell at this time of year will struggle with the disruption to some large markets and lack of public transportation. If the restrictions on transportation last through the upcoming harvest, we would expect to see a significant negative impact on farmers' ability to bring their produce to market and access buyers. Those that rely on hired or family labor for the harvest would also struggle as a result of the lack of public transportation.

Farmers' access to agricultural inputs will likely be reduced in the near term, both due to restrictions on movement and a likely reduction in availability or increase in prices as a result of the impacts the inputs sector discussed above. Input dealers may also be less willing to extend credit to their customers during this time. Access to finance will be reduced, as savings groups are unable to meet and households' physical access to banks or mobile money agents is limited. However, many farmers do not purchase their inputs until right before the planting season, so the effects may be contained. We do expect farmers to be more price sensitive next season, and perhaps buy fewer inputs, as many will have lost off-farm income and others may be more sensitive to risk as a result of the shocks.

Many farm households should be able to rely on their own production for food security, which should insulate them from increases in food prices and the impact of the restrictions on movement. However, many of these



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households also rely on non-agricultural income for food purchases and other essentials. Their ability to earn income from other sources will be seriously impacted by the closures of non-essential businesses and restrictions on movement. There could be substantial negative welfare effects for those households that rely significantly on non-agricultural income, particularly if food prices increase, with many forced to sell assets as a result.

The impact on the planting season at the end of the summer will depend on how long the various restrictions are in place, as well as the health of the other segments of the supply chain. It is too soon to say how the movements in food prices will impact planting decisions. We do expect to see farmers planting more staple crops and crops for home consumption. We would also expect to see more land under cultivation overall, as more households revert back to subsistence production as a safety net.

