Household Agriculture and Food Security in the Face of COVID-19: Evidence from Five Sub-Saharan African Countries

by Sydney Gourlay and Akuffo Amankwah

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Introduction

Countries in sub-Saharan Africa (SSA) have not been spared of the negative impact of the COVID-19 pandemic. Though countries in the sub-region have reported fewer cases of COVID-19 than other parts of the world, governments in these countries implemented various containment measures. The containment measures implemented by governments in the sub-region varied across countries, but generally included nationwide lockdown, travel restrictions, schools and offices closures, restrictions on social gathering, among others[1]. Countries were impacted at the time of other shocks such as locust invasion, fall in oil prices, climate change, among others. For instance, Uganda and Ethiopia in eastern Africa were beset with locust invasion, while the global fall in oil prices created a dual crisis for Nigeria as the country's economy is heavily reliant on oil. Overall, the COVID-19 pandemic, coupled with these other shocks, is expected to impact countries in the sub-region negatively, and articulating a policy response requires understanding how and which households have been impacted and if households may have been able to rely on or move into specific activities which may act as a buffer in times of crises.

As the pandemic started spreading to SSA, one concern has been that of its possible impacts on food security, as the crisis has the potential to exacerbate an already fragile food security environment. Prior to the onset of the COVID-19 pandemic, 57.7% of the SSA population, more than 605 million people, were moderate or severely food insecure (FAO et al, 2020). The health implications, movement restrictions, food supply disruptions, and other shocks brought on by the pandemic may inflict increasing food security concerns across the region.

When governments began implementing lockdown measures, there were a number of predictions and commentaries about the impact of the pandemic on the global economy, as well as regional and local impacts (Martin et al 2020; Dabalen and Paci 2020). As micro-level data became available, researchers began to examine the household-level impact of the pandemic (Amare et al 2020; Kansiime et al 2020; Siwatu et al 2020). While a number of studies have examined the micro-level impact or prospective impact of the COVID-19 pandemic on Africa (Amare et al 2020; Kansiime et al 2020; Siwatu et al 2020), there are limited micro-level studies examining the impact of the pandemic on agriculture and food security. Most of the micro-level analysis uses cross-sectional data collected at the start of the pandemic, without conducting a before and after analysis. This paper adds to the growing body of literature on the impact of COVID-19 pandemic by looking at the data on agriculture and food security in five SSA countries – Burkina Faso, Ethiopia, Malawi, Nigeria, and Uganda. Specifically, the paper examines households' movement in and out of agriculture before and after the start of the pandemic, as well as the impacts of the pandemic on agricultural activities since the onset of the pandemic. Agricultural shocks, changes in income, input access and expectations regarding harvests and revenue are also explored. Second, the paper examines the impact of the pandemic on household food security (prevalence of food insecurity, and the mechanisms

[1] In Malawi, schools were closed but a planned nationwide lockdown was challenged in court, and ultimately was not implemented.

behind increasing insecurity) using the Food Insecurity Experience Scale (FIES) methodology developed by the Food and Agriculture Organization (FAO). Specifically, for Nigeria where data is available, we examine household transition in and out of food security before and after the start of the pandemic. The rest of the paper is organized as follows. Section two contains the data sources and analytical methods used in the study. In section three, we present the results of the study, while section four concludes the paper.

2. Methods

2.1. Data

Data from a series of high-frequency phone surveys (HFPS) allows for the analysis of food security challenges in the midst of the COVID-19 environment. The HFPS data used here have been collected primarily by national statistics offices[2] of five SSA countries, with support from the World Bank's Living Standards Measurement Study (LSMS) team.[3] These five countries are part of the LSMS-Integrated Surveys on Agriculture (LSMS-ISA) project that fields longitudinal, multi-topic household surveys with focus on agriculture. Thus, the households included in the HFPS were also interviewed as part of the LSMS-ISA panel survey conducted in these countries. A uniform methodology was adopted in sampling, weighting, and implementing the HFPS across the countries, making cross-country comparison feasible. While the phone surveys began after the onset of the COVID-19 pandemic, the timing of implementation varies across countries. Table 1 gives the sample distribution across countries and the rounds of the phone survey data that is used for the analysis.

Table 1: Distribution of Sample Across Countries

Country	Pre-COVID Face-to-Face Survey		Phone Survey 2020		
	Sample size	Survey Name/ Year	Sample size	Rounds Included in the Analysis	Months of Survey
Burkina Faso	7,010	EHCVM 2018/19	1,860	1, 2	July, August,
Ethiopia	4,954	ESS 2018/2019	3,011	1, 2, 3	April/May, June, July
Malawi	3,181	IHPS 2019	1,646	1, 2	May/June, July,
Nigeria	4,976	GHS-Panel 2018/2019	1,790	1, 2, 3,4	April/May, June, July, August
Uganda	3,076	UNPS 2019	2,157	1, 2	July, August

[2] The Ethiopia HFPS was implemented by a private survey firm, not the national statistics office.

3 This survey is part of the World Bank's effort to support the collection of monthly high frequency phone surveys to monitor the impact of the COVID-19 pandemic on households. For more information, see www.worldbank.org/lsms-covid19

2.2. Analytical Framework

The analyses conducted in this paper are descriptive. The FAO FIES methodology was employed to measure food security. The FIES methodology is an experience-based measure of food security using a set of 8 questions ranging from the household being worried about not having enough food to eat, to going a whole day without food. The FIES methodology has been validated to allow for cross-country use (Ballard et al 2013; Kansiime et al 2020).

3. Results and Discussions

3.1 Effect of COVID-19 on SSA Agriculture

3.1.1 Churning in and out of agriculture pre and post pandemic

Agriculture continues to be the main source of livelihood of Sub-Saharan African households, with the share of households involved in agriculture increasing since the start of the pandemic.[4] Figure 1 shows that prior to the pandemic, 81% of Nigerian households were involved in agriculture (either crop or livestock farming), but the share increased to 84% since the start of the pandemic. We observed similar results in Malawi and Uganda where 91% and 80% of households respectively, have gone into some form of agriculture since the start of the pandemic, compared to the pre pandemic levels of 85% and 76% respectively.[5]

[4] During the last post-harvest visit to the households in 2018/19, households were asked if they are involved in crop or livestock farming activities. Similarly, during the 2020 phone interviews, households were also asked if any member of their household has done any crop farming or livestock production activities since the start of the pandemic. We use these questions to construct the before and after comparison and the churning in and out of agriculture.

[5] As at the time of this report, Ethiopia was yet to collect information on post pandemic livestock production, hence the analysis is limited to crop farming.

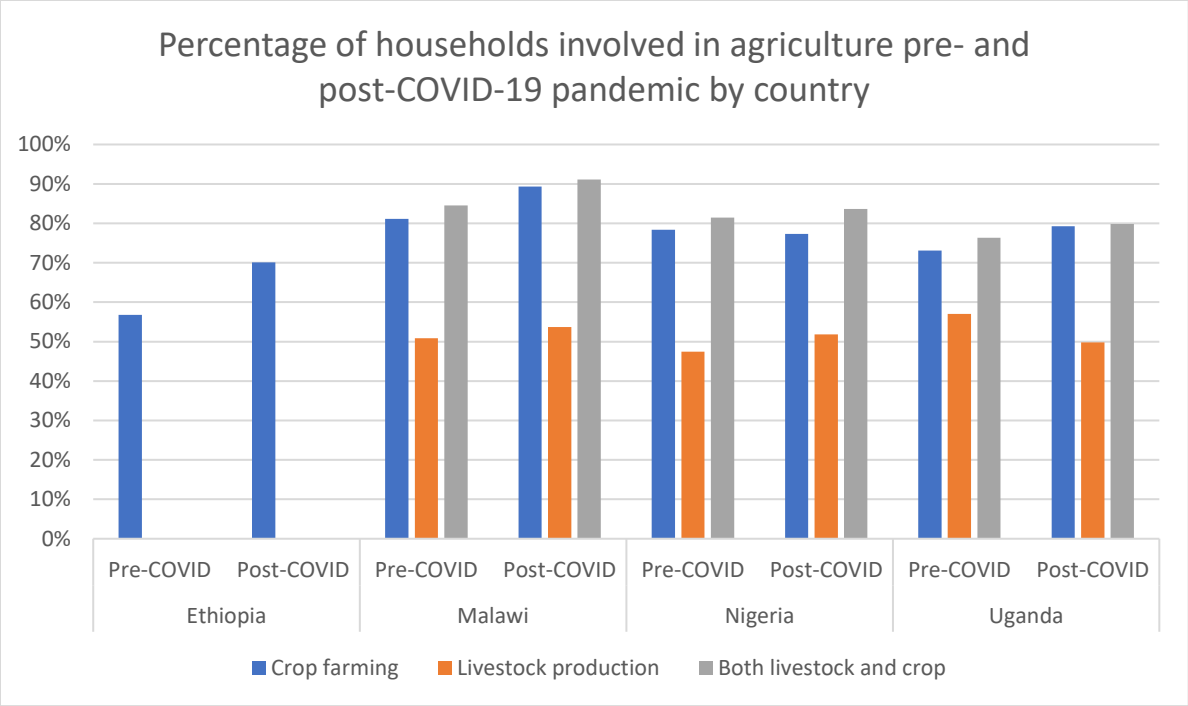

Figure 1: Percentage of households involved in agriculture pre- and post-COVID-19 pandemic by country

The changes in Figure 1 are the product of the net effect of households moving into and out of agriculture, though with unequal intensity across countries.[6] Figure 2 shows that in general, the share of households that have entered into agriculture since the start of the pandemic is higher than those exiting. For instance, in Malawi, about 8% of households who were not involved in agriculture (crop or livestock farming) before the pandemic are doing so now, compared to less than 2% that were involved in agriculture pre pandemic who are not doing so since the start of the pandemic. Similarly, the share of Nigerian households who have gone into agriculture is higher (9%) than those exiting (6%) since the start of the pandemic.

[6] We define entry and exit as those households who were not involved in agriculture pre pandemic, but are doing so now, while exit from agriculture means those who were involved in agriculture pre pandemic but are no more involved in any agricultural activities.

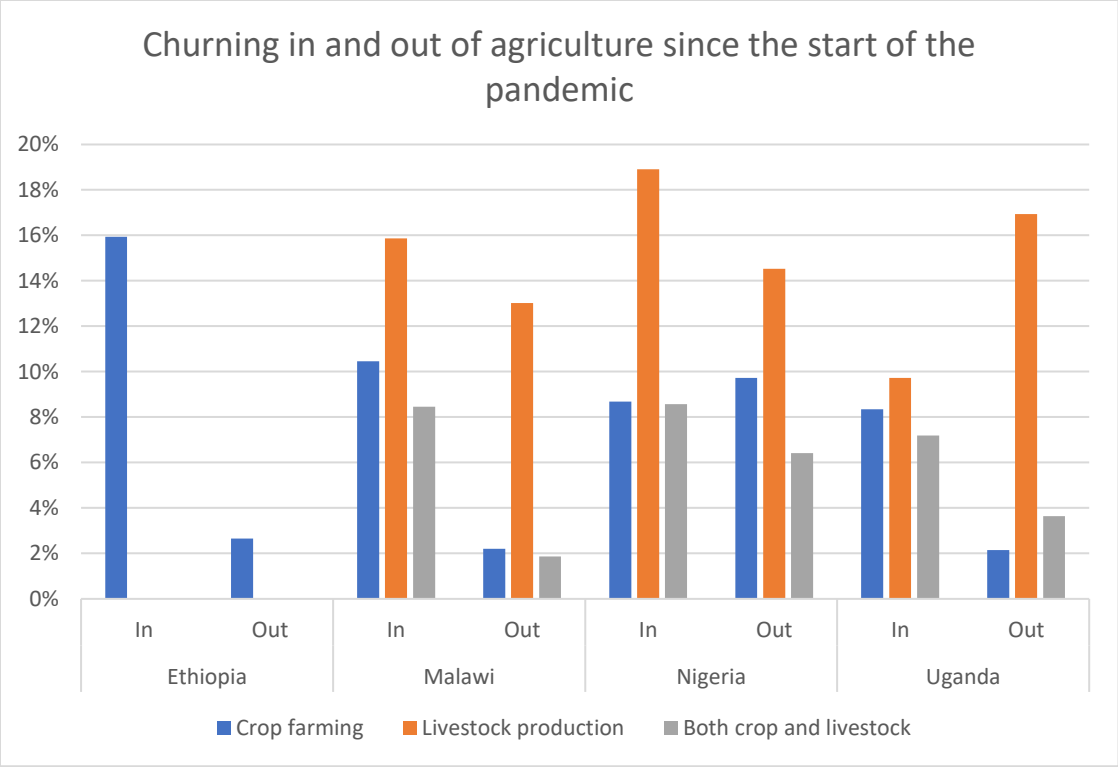

Figure 2: Churning in and out of agriculture since the start of the pandemic

We explore further how households in the study countries are churning in and out of the different sub-sectors of agriculture by looking at crop farming and livestock production separately. The share of households that have gone into crop farming seem higher than those exiting, except for Nigeria where the share of households entering and exiting seem about the same. Except for Ethiopia, the percentage of households going into livestock production seem higher than those going into crop farming since the start of the pandemic. In Ethiopia, 16% of households have gone into crop farming since the start of the pandemic, compared to 3% that exited. Similarly, in Malawi, 10% of households are cultivating crops in the 2020 agricultural season, compared to 2% that did so last agricultural season but are not cultivating in the 2020 agricultural season. The data further shows that more households in Uganda have gone out of livestock production (17%) than those entering (10%) compared to crop production where 8% and 2% have entered and exited respectively, since the start of the pandemic.

In Figure 3 we see that across countries, the movement of households into crop farming post pandemic seem to be more prevalent in urban than rural locations. Specifically, in Malawi, about 42% of urban households were involved in crop farming pre pandemic, but the share increased to about 60% post pandemic, compared to their counterparts in rural locations. We observed similar results for Nigeria and Uganda. The high increase in urban dwellers going into agriculture might be the consequence of food security and employment challenges emanating from the negative impact of the pandemic being higher in urban than in rural areas.

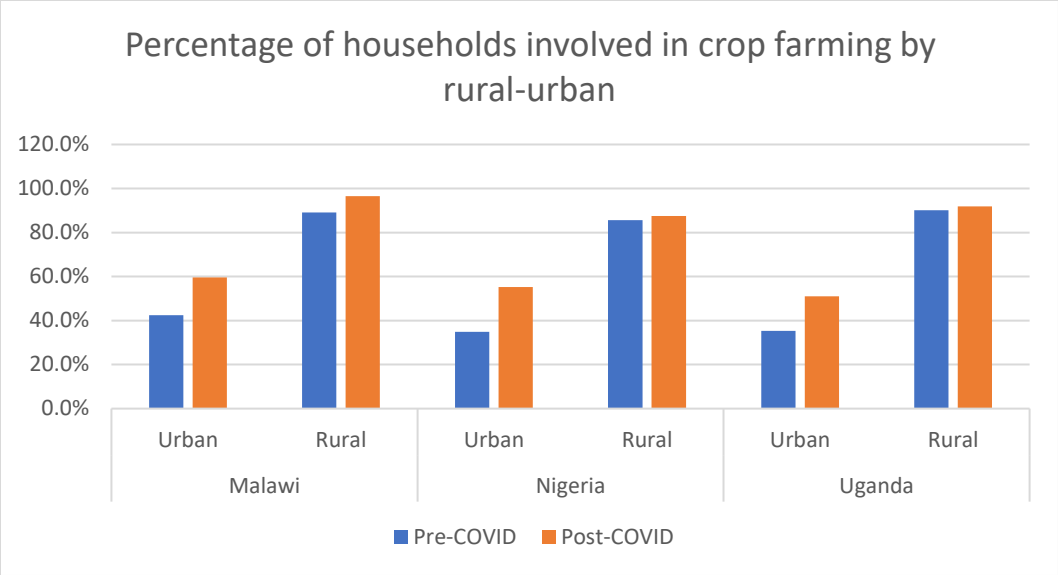

Figure 3: Percentage of households involved in crop farming by rural-urban

Looking deeper at the churning in and out of agriculture by rural-urban divide, we observe that more urban households are moving into agriculture compared to their counterparts in rural areas across countries. For instance, Figure 4 shows that 21% of households in urban Malawi who were not cultivating crops pre pandemic are doing so now, compared to 8% of their rural counterparts. Similarly, 22% of urban Nigerian households who were not doing livestock farming last season are doing so now, compared to 17% of their rural counterparts. In the case of Uganda, however, the share of urban households going into livestock production post pandemic seem to be about the same as those in rural areas, though the share of households in rural Uganda who have gone out of livestock production seems higher (20%) compared to 11% exiting in urban areas. Across countries, the data seems to suggest that rural households are exiting livestock production more than they are entering (this is even more pronounced in Uganda). Probably households are selling their livestock as a coping mechanism to the pandemic.

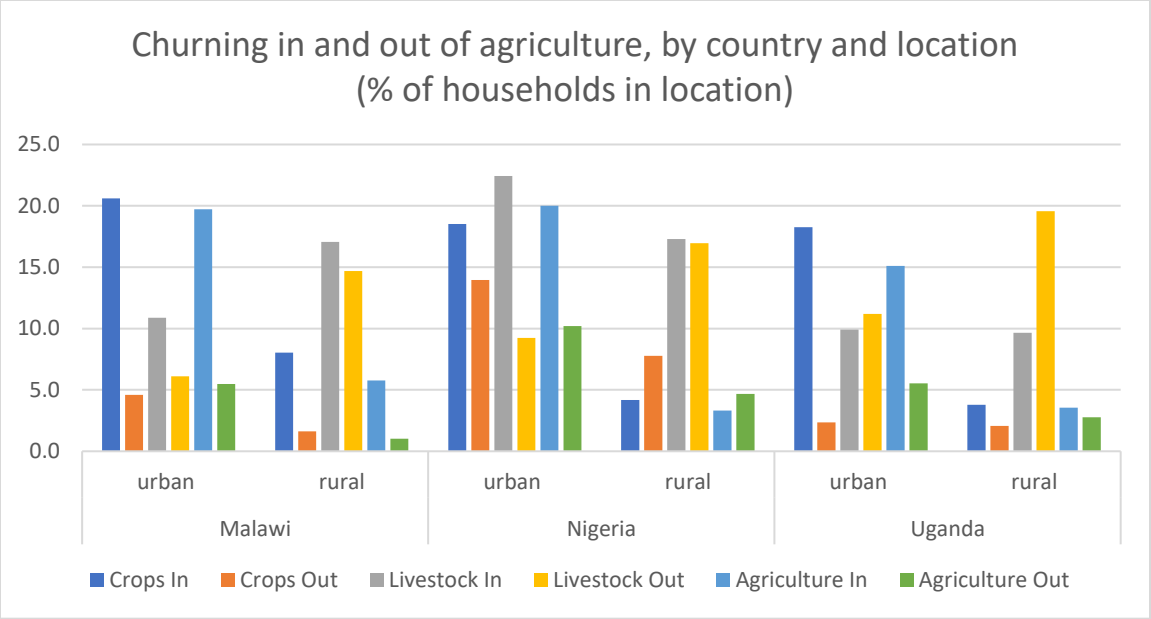

Figure 4: Churning in and out of agriculture, by country and location (% of households in location)

3.1.2 Incidence of Income Loss and Agricultural Shocks

While agriculture has been impacted by the pandemic, the effect seems less compared to other sectors. Households were asked at different rounds if they received income from specific sources (including agriculture, non-farm family business, wage and remittances from abroad) and whether the income from those sources have increased, decreased or stayed the same since the start of the pandemic. Figure 5 shows that in April/May 2020, 41% of Ethiopian households who received income from agriculture in the last 12 months, reported loss of income from agriculture, while 85% and 63% reported experiencing loss of income from non-farm family businesses and remittances from abroad respectively. Similarly, in Malawi, 59% of households who received income from agriculture in the last 12 months reported loss of income from agriculture in May/June 2020, while 79% and 81% reported loss of income from family business and remittances from abroad respectively, during the same period. We see similar results in the other countries. Across countries, the share of households reporting income loss from these sources, however, seems to be reducing in the months following the first phone interviews. This might be attributed to the easing of lockdown restrictions in the countries during the subsequent interviews.

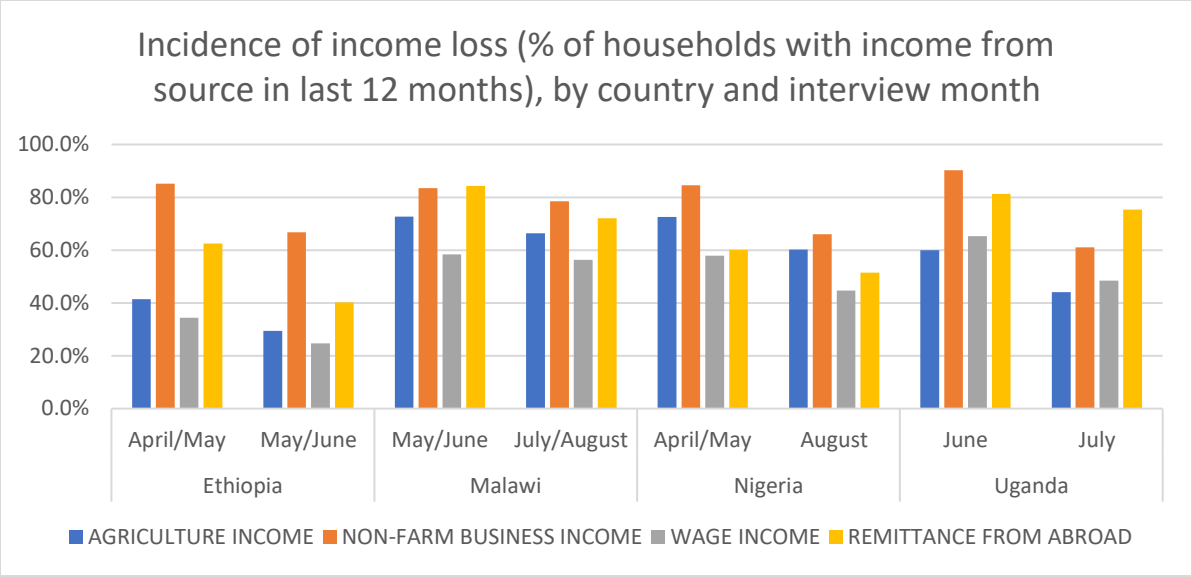

Figure 5: Incidence of income loss (% of households with income from source in last 12 months), by country and interview month

Households in SSA have also been affected by price levels. As illustrated in Figure 6, 29% of farming households in Malawi reported experiencing input price shocks, while about 30% reported output price shocks. While the share of farming households reporting input or output price shocks are low in Uganda, the shares are unsurprisingly high in Nigeria. These results corroborate the earlier discussion of COVID-19 cases and the intensity of lockdown restrictions implemented in the countries. In addition, the high percentage of households reporting shocks in Nigeria can be explained by the fact that Nigeria experienced dual crisis – COVID-19 and fall in oil prices – during the period. Also, in Malawi and Uganda, there was locust outbreak, that might have shifted households' attention from seeing the impact of the COVID-19.

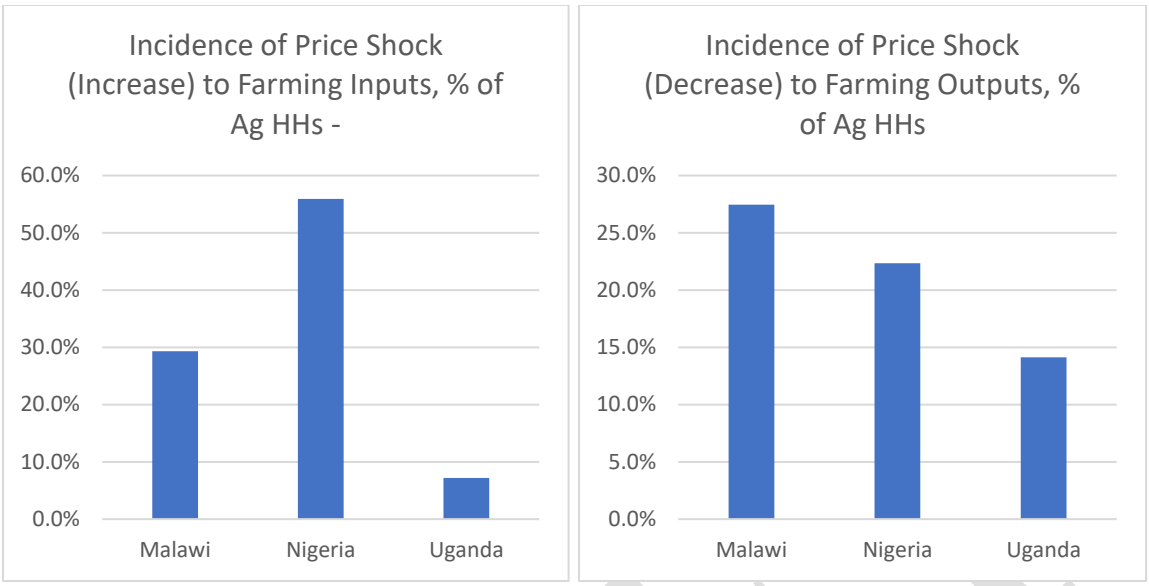

Figure 6: Incidence of Price Shock (Increase) to Farming Inputs and Decrease in Output, % of Ag HHs

Households were also asked whether or not they are able to conduct their agricultural activities normally despite the closures and restrictions in their countries. Except for Nigeria, there is little evidence of household's having issues farming, which corroborates the churning in and out of agriculture discussed earlier. For instance, in Figure 7 we see that about 34% of Nigerian households indicated that they were unable to perform their farming activities normally, while 12% of Malawian households were unable to do same, and nearly all Ethiopian agriculture households seem to have worked normally on their farms. This can further be explained by the timing of the survey, and if and when lockdowns were implemented and the extent and reach of the lockdowns in the respective countries. As discussed earlier, in Malawi where strict lockdowns were not implemented, farmers were able to go about their farming activities normally, compared to Nigeria where nationwide restrictions (including inter-state travel restrictions) were implemented for a longer period.

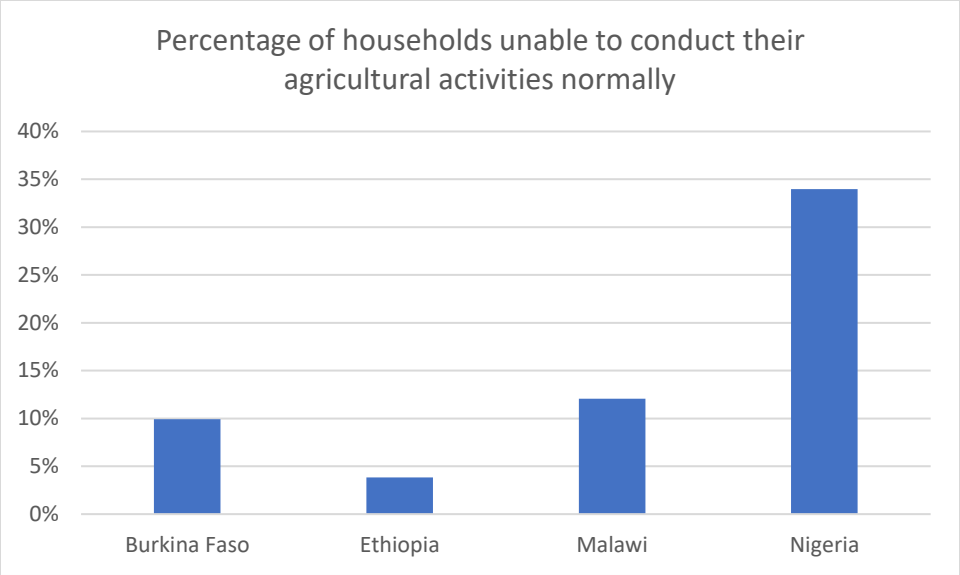

Figure 7: Percentage of households unable to conduct their agricultural activities normally

3.1.3. Expectations Regarding Harvest and Sales

During the August phone interview, agricultural households in Nigeria were asked about their expectations concerning crop harvests and revenue from crop and livestock sales for the 2020 agricultural season. In order to track how these households are updating their expectations given the changes in the country, they were presented with the same set of questions in the September round of the interview. Overall, farming households in Nigeria seem to update (change) their output and sales expectations over time due to the changes in the country. In August, about 30% (54%) of current crop farming households indicated that they expect their harvest this year to be lower (higher) than what they harvested from similar planted area last year, while the share of households who reported expected decline in output increased (decreased) to about 36% (52%) during the September interview. On the expected revenue side, we observed that the share of households anticipating reduction in 2020 agricultural season's sales revenue decreased from 29% in August to 28% in September, while the share of those expecting increase in revenue from sales rose from 56% to 62% between August and September.

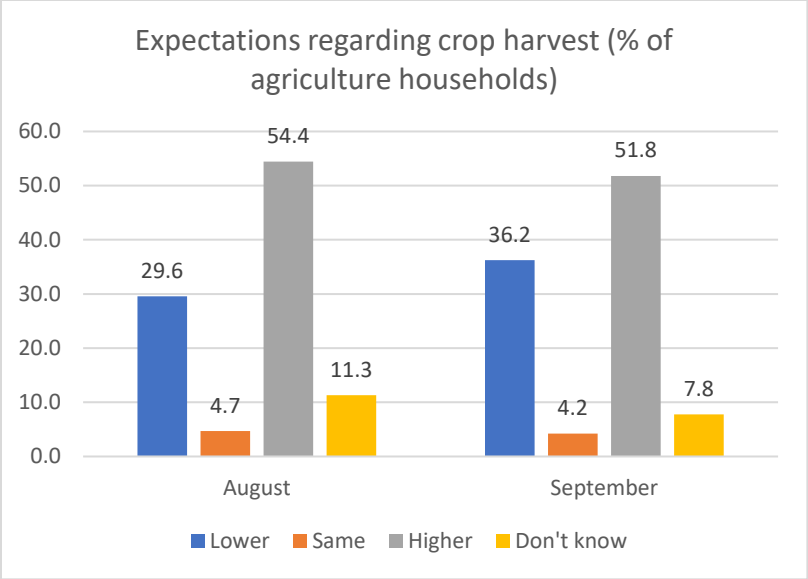

Figure 8: Expectations regarding crop harvest (% of agriculture households)

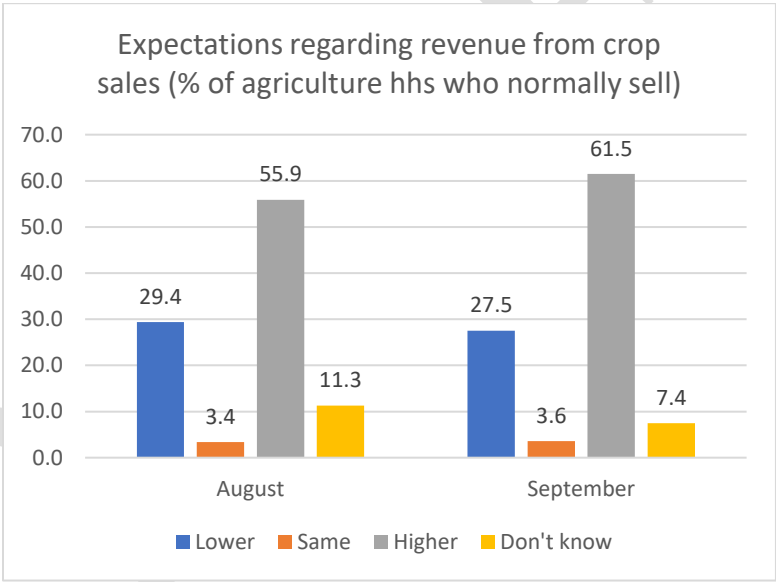

Figure 9: Expectations regarding revenue from crop sales (% of agriculture hhs who normally sell)

Similarly, the share of livestock farming households expecting their sales revenue to be higher from that of 2019 decreased from 44% in August to 29% in September, while those anticipating sales to be higher increased from 49% to 60% between August and September respectively. The share of households who expect either their harvests or sales revenue in 2020 to remain the same as that of 2019 seem stable between August and September. The details are presented in Figure 10.

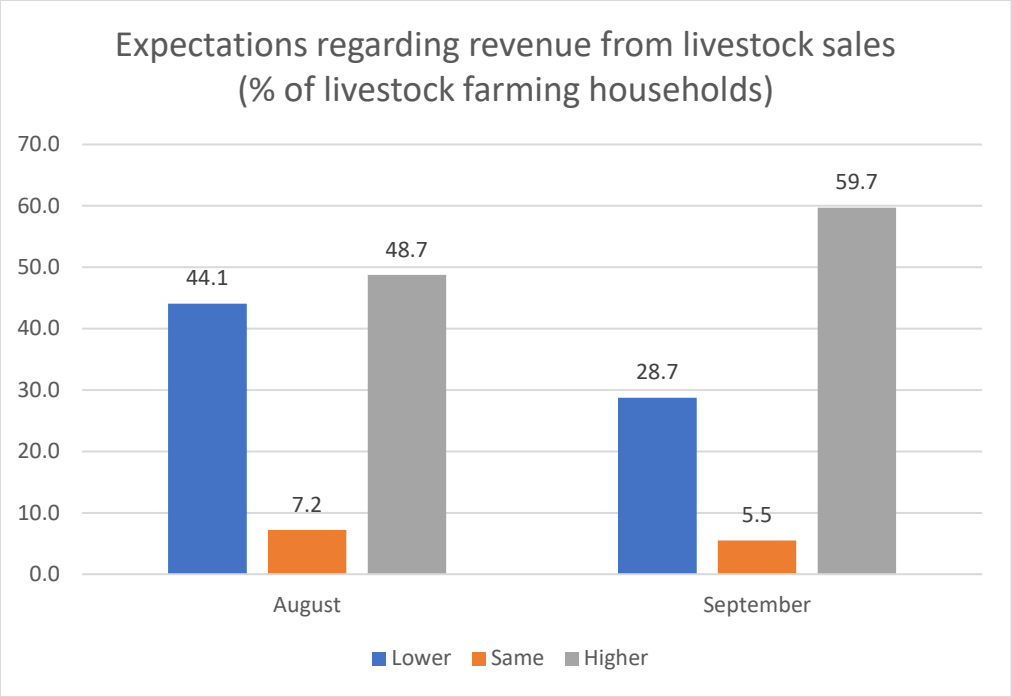

Figure 10: Expectations regarding revenue from livestock sales (% of livestock farming households)

3. 2. Food Security in the COVID-19 Environment

Food insecurity concerns pre-date the COVID-19 crisis, so how much of the food insecurity observed today can be attributed to the crises of today? Leveraging the panel nature of the HFPS data, and the consistent FIES questionnaire implementation in Nigeria, we compare the food insecurity rates before COVID-19 (from the 2018-19 GHS-Panel Survey) and after the onset of the pandemic (from the HFPS).[7] In an effort to minimize the impact of seasonality on FIES estimates, we limit the analysis sample to households that were interviewed in July 2018 to be compared with the estimates from HFPS interviews conducted in June 2020, both in the pre-harvest phase of the agricultural calendar (resulting in a sample of 892 households).[8] The 2018-19 data suggests that 46.8% (13.9%) of adults were moderately or severely (severely) food insecure. The HFPS post-COVID data suggests a significant increase in the prevalence of food insecurity since July 2018, with 75.1% moderate or severely food insecure and 32.6% severely food insecure.[9]

[7] This analysis is only possible for Nigeria given the comparability of the questionnaires pre- and post-COVID.
[8] Optimally we could compare interviews that were conducted in the same month. However, GHS-Panel data collection was not conducted in June. Therefore, restriction to July GHS-Panel interviews is the most appropriate restriction given the data constraints.
[9] Without restrictions on the sample, data from the 2018-19 GHS Panel Survey, supported by the LSMS-ISA, suggest that 50.1% of the Nigerian adult population suffered from moderate or severe food insecurity, while 14.1% suffered from severe food insecurity. The full Nigeria HFPS suggests the prevalence of food insecurity has increased to 75.7% and 33.8%, respectively.

Figure 11 depicts the movement of households from a food insecurity status to a food secure status, and vice versa, for both moderate and severe food insecurity.[10] Forty-three percent of households who were not severely food insecure in July 2018 were severely food insecure as of June 2020, representing a dramatic increase likely attributable at least in part to the COVID-19 pandemic. The incidence of moderate and severe food insecurity among the sample also increased significantly, with 71% of households that were considered as food secure in July 2018 moderately or severely food insecure in June 2020.

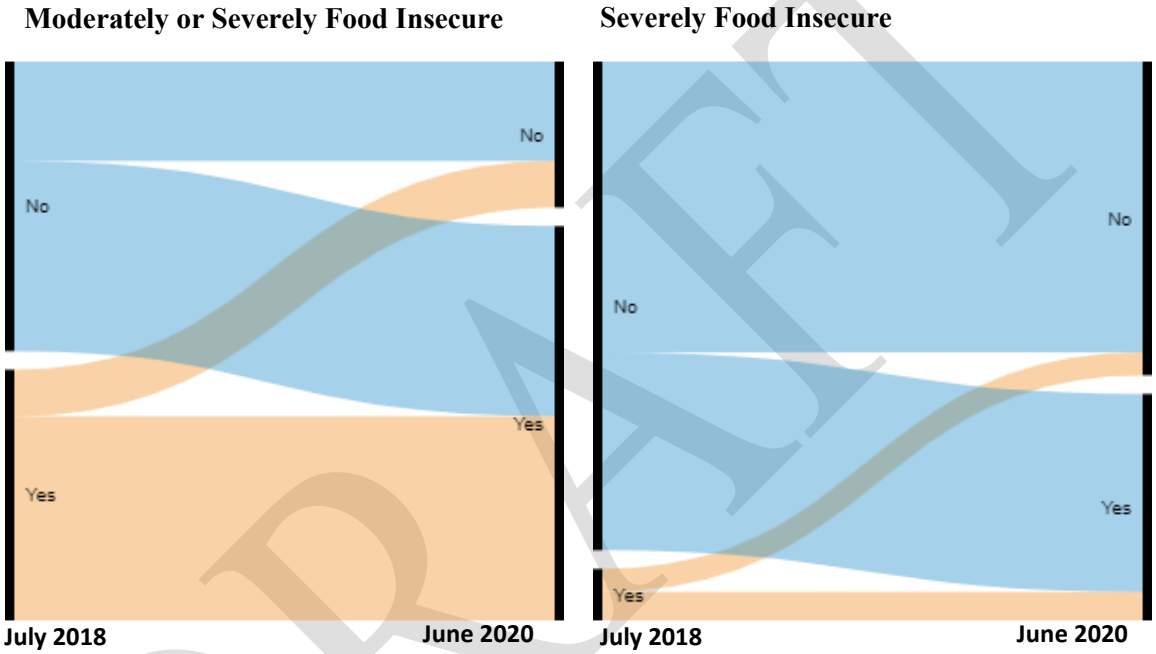

Figure 11. Tracking Food Insecurity Over Time for Nigeria. The figures compare the food insecurity status of a subset of Nigerian households in July 2018 and June 2020. The sample is limited to households with interviews in those months to reduce the impact of seasonality.

The high incidence of food insecurity observed above is not unique to Nigeria. By employing the FIES methodology, we estimate the overall food insecurity rates for both moderate and severe food insecurity.[11] As illustrated in Figure 12, over 70% of adults in Nigeria and Malawi are impacted by moderate or severe food insecurity, as well as 47% in Ethiopia, 42% in Burkina Faso, and 43% in Uganda.[12] Over 30% of adults in Nigeria and Malawi are plagued by severe food insecurity, as well as 9% of Ugandan adults, 8% of Burkinabe adults, and 13% of Ethiopian adults.

[10] For the purposes of comparing food insecurity status over time, households are assigned to a food insecurity class based on the probably they are food insecure. That is, if a household has a probably greater than 50% that they are moderately or severely food insecure, they are classified as such.

[11] Prevalence of moderate and severe food insecurity estimated according to the FIES methodology, which employs item response theory. For details on the methodology, visit http://www.fao.org/in-action/voices-of-the-hungry/en/.

[12] Note that figures on FIES reflect the following survey rounds unless otherwise indicated: Burkina Faso – Round 2 (August); Uganda – Round 1 (June 2020); Nigeria – Round 2 (June 2020); Malawi – Round 1 (May/June 2020); Ethiopia – Round 3 (June 2020).

Food insecurity appears to affect rural households disproportionately vis-à-vis urban households in Burkina Faso, Ethiopia and Malawi, with a greater share of the rural population experiencing moderate or severe food insecurity (Figure 13). In Nigeria and Uganda, there is no significant distinction between the prevalence of moderate or severe food insecurity across urban and rural populations.

The HFPS data also reveals a clear relationship between food insecurity and well-being across all countries. Leveraging the consumption indices of the pre-COVID LSMS-ISA surveys, we estimate the prevalence of food insecurity by consumption quintile. Figure 14 illustrates this relationship, with households in the lower end of the consumption distribution presenting a higher rate of both moderate and severe food insecurity, particularly in Burkina Faso, Ethiopia, Malawi, and Uganda.

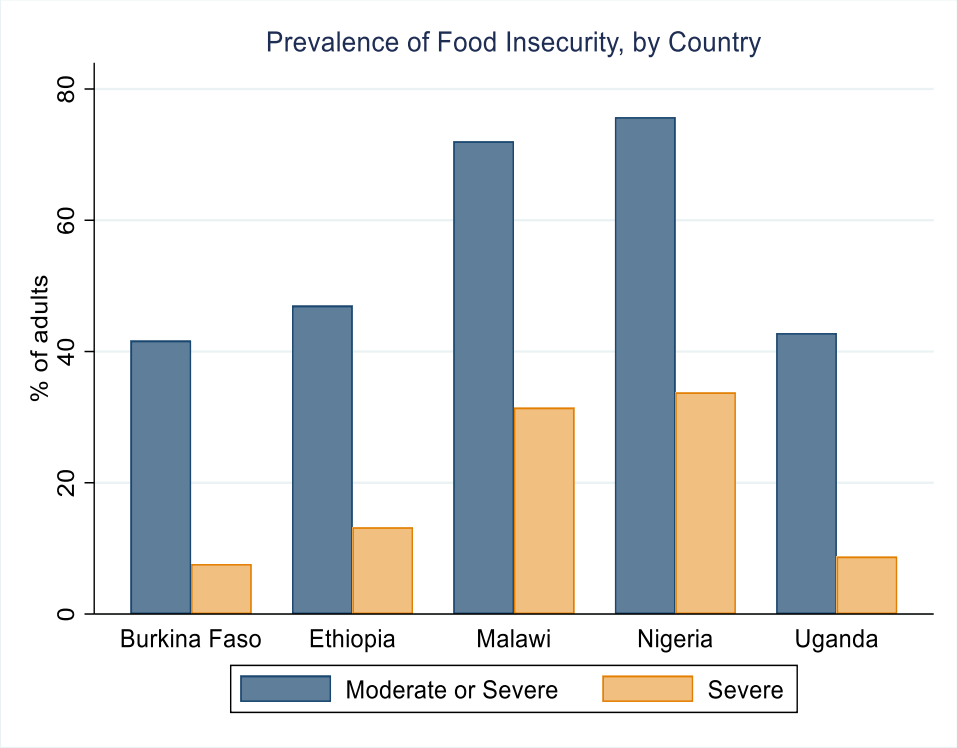

Figure 12. Prevalence of Food Insecurity, by Country

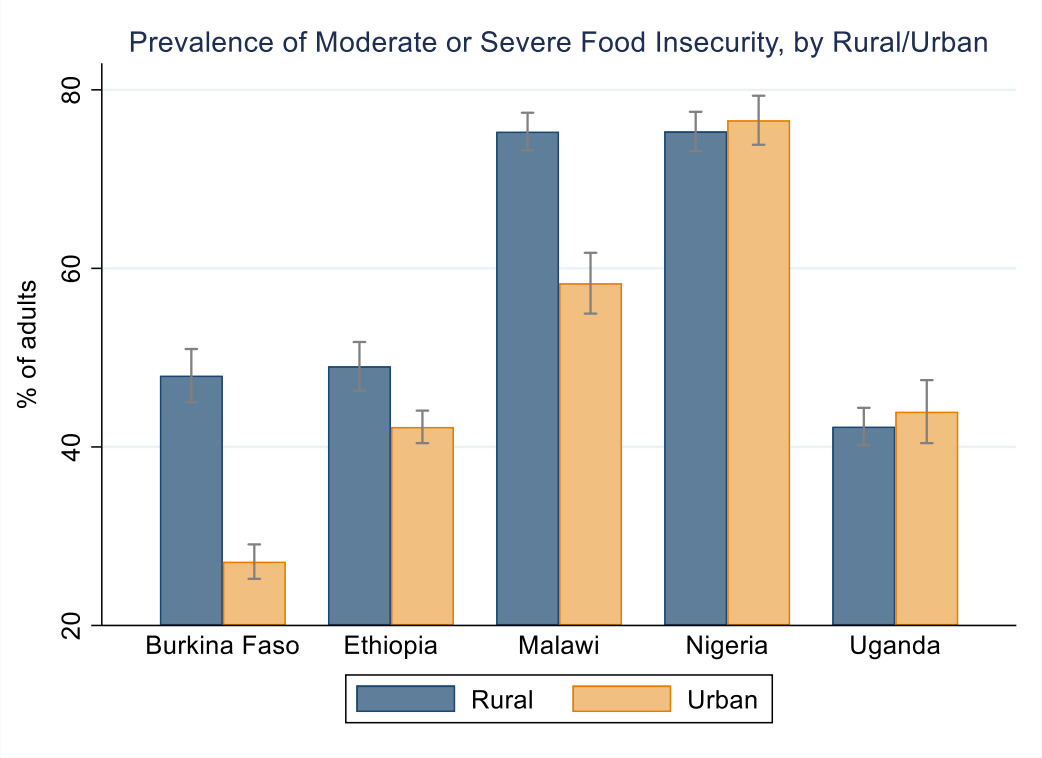

Figure 13. Prevalence of Food Insecurity, by Rural/Urban

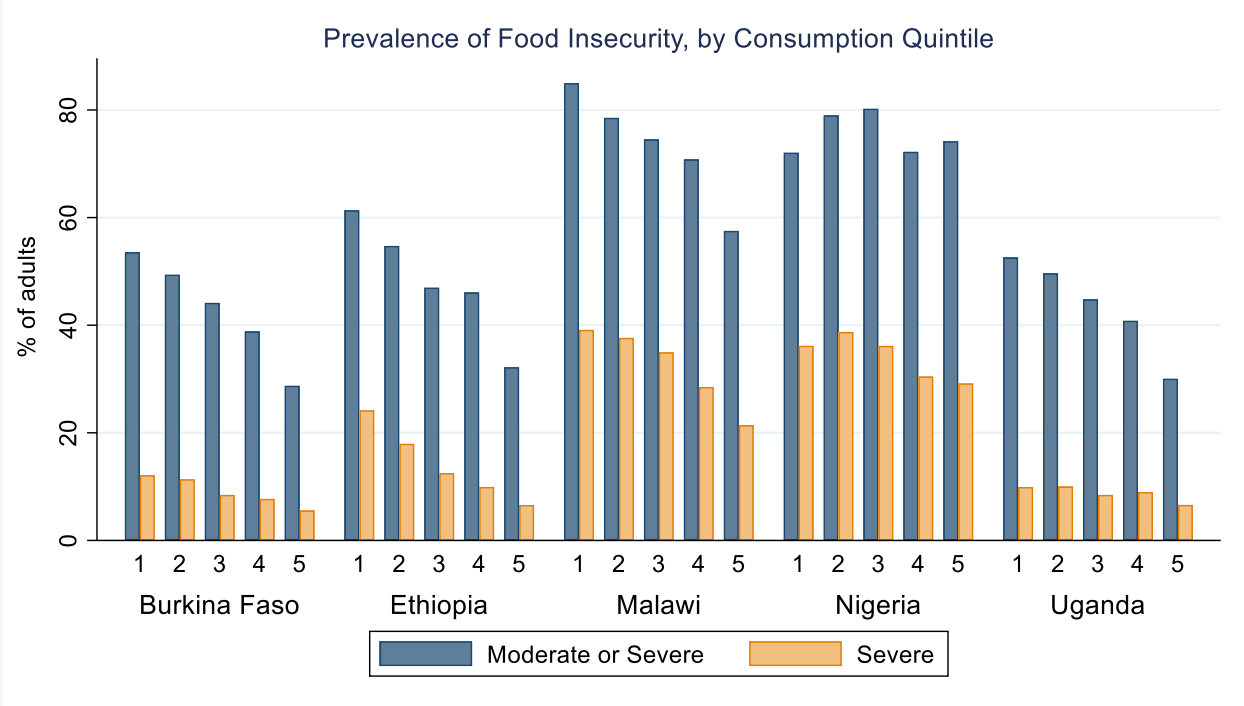

Figure 14. Prevalence of Food Insecurity, by Consumption Quintile

What exactly does food insecurity look like on a daily basis? The FIES questions, which include eight questions on behaviors related to household food availability, allow us to assess the degree to which households restricted food consumption. Food consumption was a source of worry for the majority of adults in all countries, with 57%, 71%, 72%, 58%, and 62% of adults worrying they would not have enough food to eat in Ethiopia, Malawi, Nigeria, Uganda, and Burkina Faso, respectively (Figure 15). The majority of adults were also forced to skip at least one meal in Malawi and Nigeria, while more than 30% of adults skipped a meal in Burkina Faso, Uganda, and Ethiopia. Food consumption was severely limited in a large share of households, with nearly 35% of adults in Malawi and Nigeria going at least one whole day without eating. Adults in 12% of households in Ethiopia, 10% of households in Uganda, and 18% of households in Burkina Faso also went at least one whole day without eating.

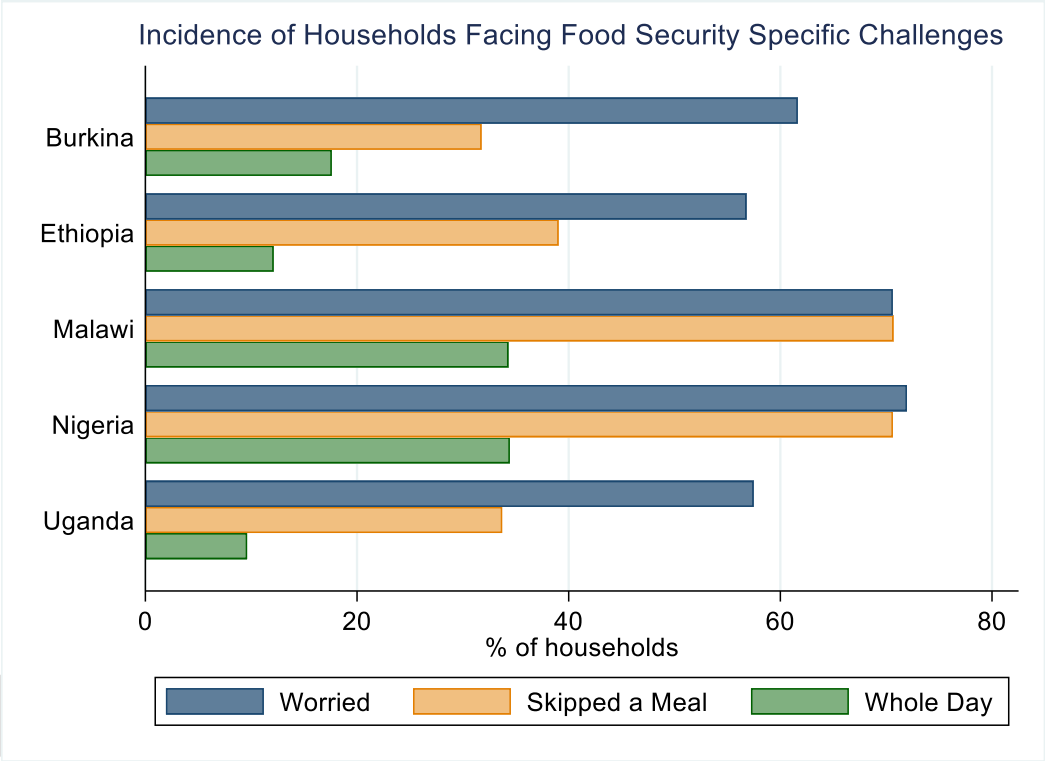

*Figure 15. Percent of households that **worried** about not having enough food to eat, had to **skip** a meal, or went a **whole day** without eating in the 30 days preceding the interview.*

Of the many shocks endured by households since the onset of the pandemic, increase in the price of major food items consumed by the household was one of the most prevalent. In Malawi, 66% of all households reported an increase in the price of key consumption goods, while the same was true for 90% of Nigerian households (July 2020). Increases in the market price of consumption goods will harm the food security of households, particularly those without the ability to produce their own food or in the lower end of the consumption distribution. While there seem to be similar distribution of households reporting experiencing shocks due to increase in food items consumed across rural-urban divide in Nigeria and Burkina Faso, the impact appears to be more severe among rural households in Malawi (Figure 16).

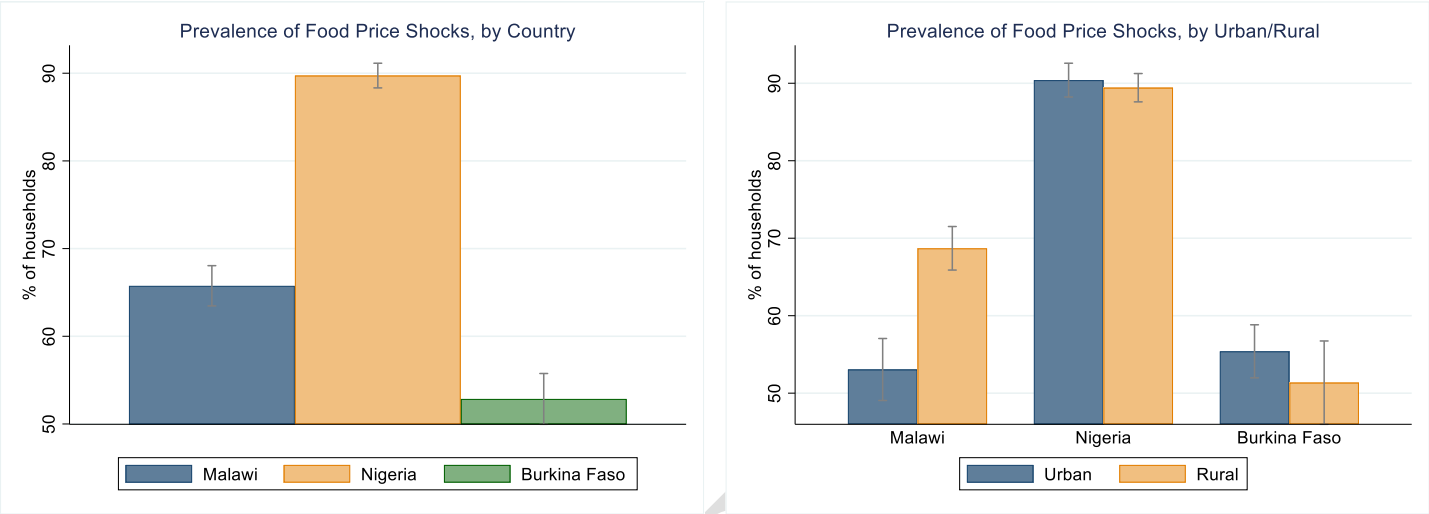

Figure 16. Prevalence of Food Price Shocks, by Country (left) and Urban/Rural Status (right)

Food consumption, though a basic need, is one of the levers used by many households to cope with shocks of all types. In July 2020, 66% of Nigerian households reduced food consumption as coping mechanism, up from about 51% of households in April/May 2020 (Figure 17). The same is true for 9% of households in Malawi. Sixteen percent of Ugandan households reduced food consumption in response to a variety of shocks, with 9% of households limiting food consumption in response to income loss in Ethiopia (June 2020).[13]

The HFPS provides evidence that the restriction of food consumption as a means of coping with shocks is a behavior observed in households across the consumption distribution. There is evidence, however, that as the pandemic progresses, more households in the lower quintiles are restricting food consumption due to shocks. Figure 18 presents the share of households that reduced food consumption in two consecutive months for Nigeria and Ethiopia.[14] In both countries, the prevalence of this food reducing behavior increased in the second month of interview, and it increased more for households on the low end of the consumption distribution. The change was extremely pronounced in Nigeria, where there is a dramatic increase in the restriction of food consumption of the households in the poorest two quintiles as the pandemic state extended. This may suggest that the longer the COVID-19 environment persists, the more vulnerable households will be impacted, and potentially to a disproportionate degree.

[13] In Ethiopia, coping mechanisms questions were presented to respondents in the context of their responses to income loss rather than to shocks in general.
[14] Ethiopia and Nigeria were the only two countries to include the relevant data in more than one interview, as of the date of publication.

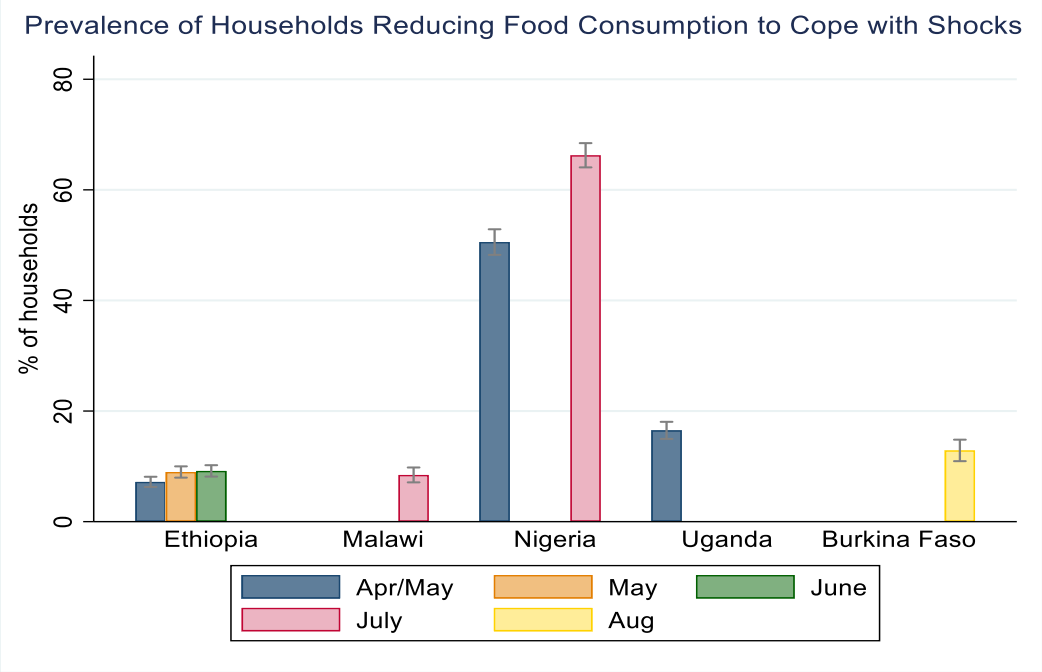

Figure 17. Prevalence of households reducing food consumption to cope with shocks (% of all households), by country and survey round.

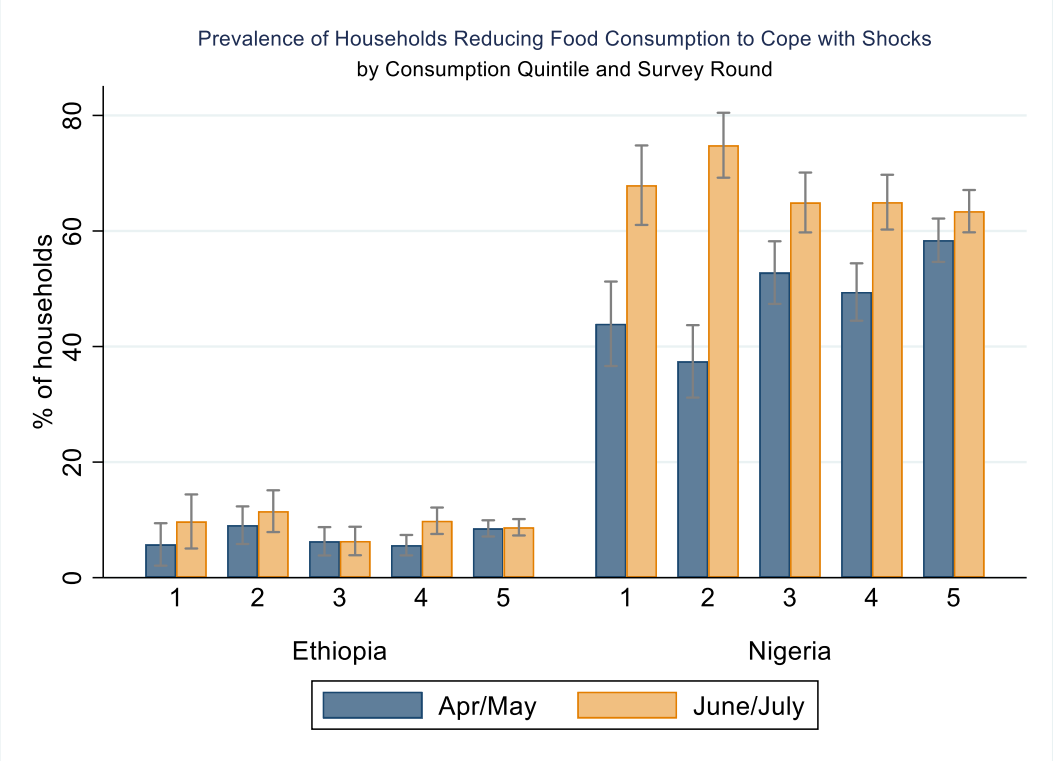

Figure 18. Percent of Households Reducing Food Consumption to Cope with Shocks Over Time, by Consumption Quintile.

4. Conclusions

The paper explores households' agricultural activities and food security in the COVID-19 environment in five sub-Saharan African countries. The paper uses data from a series of nationally representative high frequency phone survey that leverages an existing panel sample. The survey uses uniform methodology for sampling, implementation and weighting, thereby allowing for cross-country comparison.

The results show households entry and exit into agriculture since the start of the pandemic, though with unequal intensity across countries. The churning into agriculture is more prevalent among urban than rural households. While agriculture has been impacted by the pandemic, the effect on agricultural income appears relatively less compared to other sectors as the share of households experiencing income loss from wage, non-farm family business and remittances seem more than that of agriculture.

The data show further that the food security situation in the subregion has worsened since the start of the pandemic. Specifically, over 70% of adults in Nigeria and Malawi are impacted by moderate or severe food insecurity, as well as 47% in Ethiopia, 42% in Burkina Faso, and 43% in Uganda. Over 30% of adults in Nigeria and Malawi are plagued by severe food insecurity, as well as 9% of Ugandan adults, 8% of Burkinabe adults, and 13% of Ethiopian adults. In Nigeria where we had data on household food security pre pandemic, we find evidence that about 41% of food secure households pre pandemic became severely food insecure since the start of the pandemic. Food insecurity appears to affect rural households disproportionately vis-à-vis urban households in Burkina Faso, Ethiopia and Malawi, with a greater share of the rural population experiencing moderate or severe food insecurity.

Finally, the results show that SSA households have experienced a myriad of shocks since the start of the pandemic. In Malawi 65% of all households reported an increase in the price of key consumption goods, while the same was true for 90% of Nigerian households (July 2020). Similarly, 29% of farming households in Malawi reported experiencing input price shocks, while about 30% reported output price shocks. Food consumption, though a basic need, is one of the levers used by many households to cope with shocks of all types. In July 2020, 66% of Nigerian households reduced food consumption as coping mechanism, up from about 51% of households in April/May 2020. The same is true for 9% of households in Malawi.

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