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Covid-19 Bulletin

The Impact of the COVID-19 Pandemic on Staples Food Prices in Local Markets: The Case of Maize Markets in Kenya

Paul Guthiga, Leonard Kirui *and* ***Joseph Karugia***

This bulletin analyzes the short-run effects of the COVID-19 pandemic and measures taken by government to control it on maize prices across local markets in Kenya. The analysis involves a comparison between the actual monthly prices with predicted prices that would have prevailed based on seasonal patterns and historical price data from January 2011 to December 2019. The bulletin focuses on 10 markets located in both maize surplus and deficit areas over the first seven months of 2020.

Price data was obtained from the World Food Programme (WFP) online food price data base (https://data.humdata.org/dataset/wfp-food-prices-for-kenya). WFP was chosen because of the completeness of the data. An alternative source, a monthly publication of the Kenya National Bureau of Statistics (KNBS) known as the 'Leading Economic Indicators' was considered but was not adopted because the data had many gaps.

Maize is the most important food staple in Kenya, that plays a central role in national food security. On average, the country produces about 3 million tonnes per year out of which approximately 15% sold directly through the National Cereals and Produce Board (NCPB) and large millers from the surplus production areas mostly located in the western region of the country. NCPB is the strategic food reserve agency owned by government through which the state intervenes in the maize market by providing both production support (fertilizer subsidies) and regular price support (through buying maize often at price above the open market from middle and large scale farmers). Despite government intervention over the years, the

LOCAL STAPLE FOOD MARKET DYNAMICS UNDER COVID

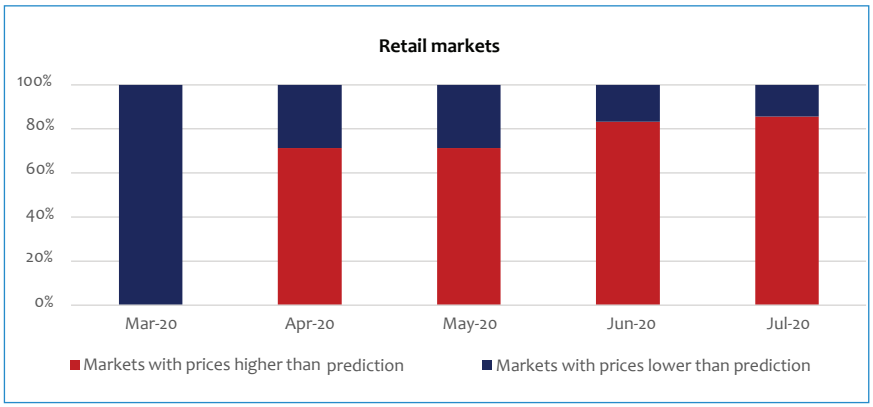
The pandemic is likely to be more disruptive to local food markets and thus have more serious effects on the poorest and most vulnerable groups and communities than any of the crises in recent years. This is because the poor and vulnerable are affected by changes in local food staple prices significantly more than other population groups, not only because of more limited purchasing power but also because of differences in consumption baskets. Moreover, domestic markets for local food staples such as yam, cassava, white maize, cowpeas, millet or sorghum tend to behave differently during times of crisis than global markets for major commodities such as rice, wheat or yellow maize. For instance, the last global food price crisis had much more significant impacts on the latter group of food commodities. Local food staples markets tend to be rather segmented from global food markets. Staple food prices therefore tend to be isolated from global market shocks. The difference with Covid is that the disruption of food supply chains has hit both domestic and global food markets rather badly.

The global nature and complex ramifications of the pandemic make it impossible to avoid the pain from rising food prices, in particular among vulnerable groups. Different staples weigh differently in local diets. Different communities are affected differently by changes in prices of different staples. Some markets are more connected than others and therefore price changes for the same staple food vary across geography and over time. Consequently, a good understanding of how local staples markets behave and close tracking of changes in food prices at community level have to be key elements of any strategy to protect livelihoods. AKADEMIYA2063 scientists and their partners are working to ensure that governments and other national stakeholders have sufficient information to plan and respond to the effects of the pandemic on local markets.

Ousmane Badiane, Executive Chairperson

country still faces a structural production deficit that is met through duty free imports from neighboring countries (Uganda and Tanzania) and sometime from international markets. Given the unpredictable nature of

Figure 1. : Share of markets with higher than predicted prices in retail markets



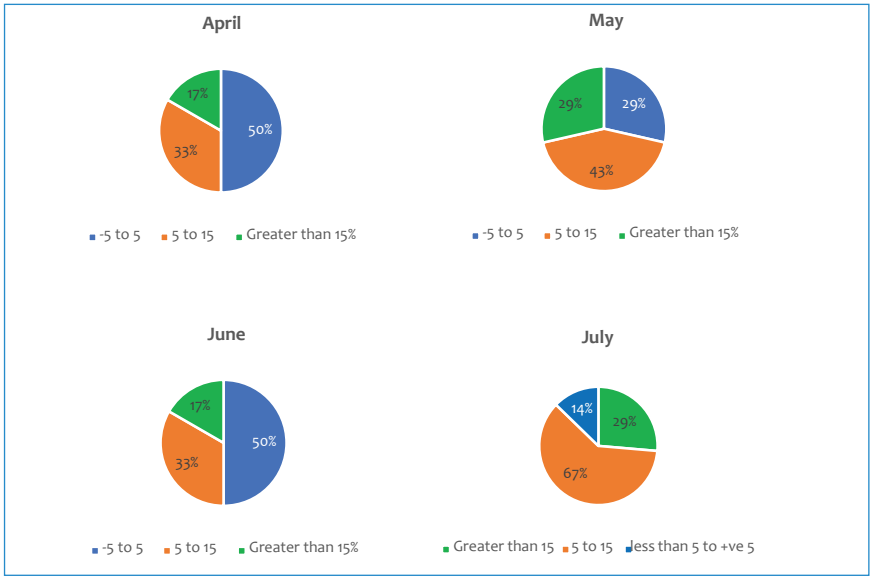
Source: Authors' computation based WFP online price data base, 2020

the maize market in Kenya, the effects of COVID-19 disruption has to be interpreted taking into account other compounding factors. The normal seasonal price variations are however controlled by the model chosen for analysis. Other production side shocks at play include the massive locust invasion that started in late in 2019 and affected large areas in the north and eastern parts of the country and above normal rainfall and associated floods that affected most parts of the country (October 2019 to May 2020).

The SARIMA model, as an extension of the ARIMA model which is the common linear approach for predicting future time-series, was used to compare the actual monthly prices of maize with the predicted prices. Price variations between -5% and +5% were considered normal trend following Taondyandé *et al.,* (2020). We however acknowledge that more advanced methodological approaches such as the Mean Absolute Percentage Error (MAPE) exists and could provide alternative analytical approach to determine whether price variations are within normal range or not. This method will be deployed in a subsequent more elaborate brief that will be prepared following this bulletin.

The findings focus on the period from March to July 2020, during which different measures were put in place to contain and control the spread of COVID-19 whose first case was reported in Kenya on March 13th, 2020. The government instituted measures including restriction of movement

Figure 2: Changes in market prices among Consumption markets from April to July



Source: Authors' computation based WFP online price data base, 2020

into and out of major cities, closure of markets and imposition of strict rules for opening and operation of the markets. Other measures included partial closure of borders and requirement of COVID-free certificates for the cross-boarder truck drivers, prohibition of unnecessary travel, requirement of disinfection of transport vehicles, requirement for personal protective equipment for truck drivers, night curfew throughout the country among other measures with potential to directly or indirectly affect the prices of maize and other agricultural products. The findings are discussed in the subsequent sections.

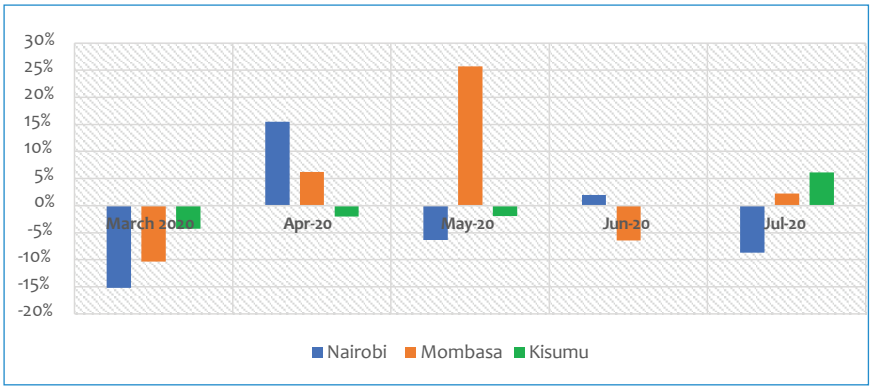
Restrictions affected the maize prices as indicated by many retail markets recording higher prices than predicted.

The effects of COVID-19 and the related government actions are observable from behavior of maize prices between March and July across local markets. As would be expected, restrictions enacted in March to limit the movement of people, which in turn affected the movement of goods, led to a rise in maize prices above the prediction in majority of retail markets. Figure 1 shows that the proportion of markets that recorded higher than predicted prices increased steadily from March to July 2020.

Actual prices in the retail markets were observed to be higher than the predicted prices in most of the markets from the beginning of the confinement; rising steadily from 0% in March, when the restrictions had not been effected to 85% in July when strict cessation of movement measures were lifted. Retail markets experiencing high to moderate increases in actual price deviation from predicted prices between April and July (See Figure 2).

In April, soon after the imposition of control measures, about 17% of the markets experienced actual prices that were 15% or higher than predicted prices; rising to 29% in May, dipping a bit in June and rising again to 29% in July towards the end of the period of strict control (see Figure 2).

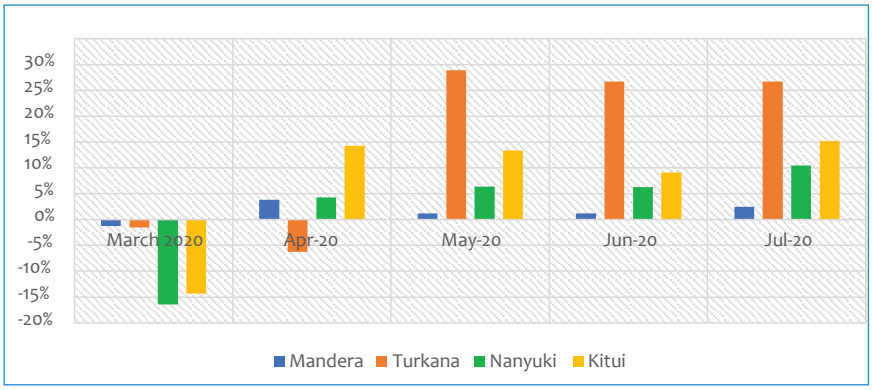
Figure 3: Actual and predicted Maize prices in major cities (Ksh/Kg)



Source: Authors' computation based WFP online price data base, 2020

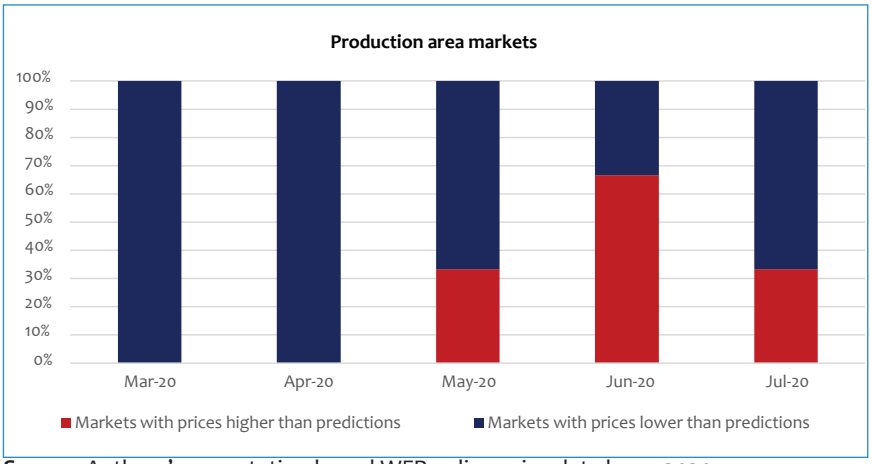
Figures 3 shows the difference in percentage between actual and predicted prices in major cities between the month of March to July 2020. During the month of March all the major cities were experiencing maize prices that were lower than precited. Nairobi, the capital city had prices that were 15% lower than predicted. During the month of April when COVID-related restriction came into effect, a sharp rise in price was observed in Nairobi and Mombasa (the two cities in which cessation of movement was instituted). Cessation of movement in and out of Kisumu was not instituted and that could probably explain the observation that prices remained slightly lower that predicted in April, May, June with only a slight rise in July. Furthermore, Kisumu though a maize deficit area borders the surplus regions in western Kenya and maize could still flow with much ease compared to Nairobi and Mombasa that are located further away and were under strict cessation of movement orders in effect.

Figure 4: Actual and predicted prices in Maize deficit counties (Ksh/Kg)



Source: Authors' computation based WFP online price data base, 2020

Figure 5: Share of markets with higher than predicted prices in production area **markets**



Source: Authors' computation based WFP online price data base, 2020

During the months of May-July, the behaviour of actual prices in Nairobi compared to prediction were somewhat abrupt; it is difficult to pin-point excatly why such behaviour was observed however, it may reflect the short term adjustment in supply and demand dynamics. The restriction in supply chains due to strict protocals could explain the slight increases say in July while the depressed demand (e.g. closure of hotels and restaurants) could expain the dip in prices in May and July. The same explanation applies to the dip in price in the costal city of Mombasa in July.

In th deficit towns, the situation is less abrupt as shown in Figure 4. In all the towns considered, the prices in March were lower than predicted soon after the restriction were put in they stayed higher than predicted till July except for Turkana during the month of April that still enjoyed slightly lower prices that would be predicted.

Moderate to normal increase in the price of maize in surplus area markets

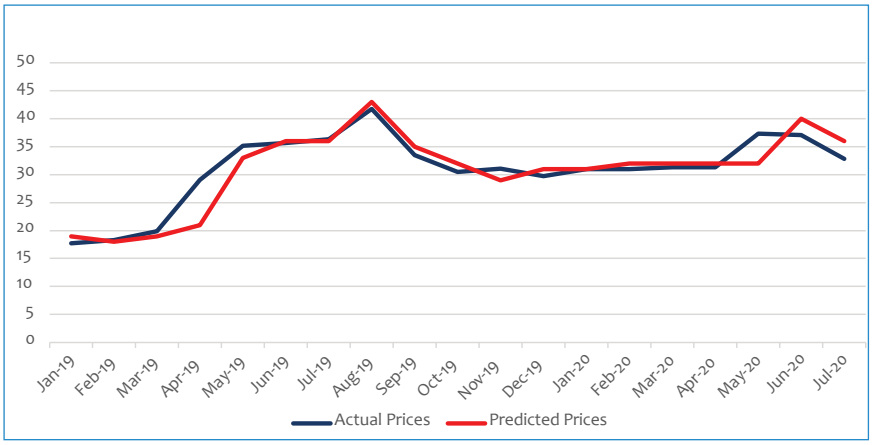
In the surplus areas, the market prices for March and April were lower than predicted in all the markets that were considered. During the month of May however, 35% of the markets in surplus areas were reporting higher prices than predicted and this rose to 65% of the market in June before easing down in July (35%) (see Figure 5).

The maize surplus areas experienced a decline in price or just a moderate price increase between March and July. In March and April all the markets experienced prices that were lower than predicted mostly likely due to an exceptionally good rainy season (October-December

Figure 6: Actual and predicted Maize prices in Eldoret (Ksh/Kg)

Source: Authors' computation based WFP online price data base, 2020

Figure 7: Actual and predicted Maize prices in Nakuru (Ksh/Kg)



Source: Authors' computation based WFP online price data base, 2020

period) and Feb-May. Some markets began experiencing higher than predicted prices in May and June with the share declining in July when cessation of movement measures were eased. Figures 6 and 7 show trends in actual and predicted prices for Eldoret and Nakuru respectively (Jan 2019-July 2020). These are assembly markets in surplus areas.

A closer look at Figure 7 shows that the during the same period in 2019 (April to July), the Eldoret market was also experiencing actual prices that were higher than predicted. This observation begs the question of whether the observation is structural and therefore unrelated to the effects of COVID-19 related restrictions. We analyzed and compared the actual and predicted prices over the past five years (2015-2020) and ruled out any structural pattern. The observation of higher actual prices in 2019 was unique for that year and could be explained by the prevailing situation in area at the time at the intervention of the NCPB. The country had experienced a drought in 2018, at NCPB bought maize from farmers at almost double the prevailing market prices in the Eldoret area that lead to a general rise in price and widely reported in the local media. We are therefore confident that the observed price behavior in 2020 are related to the effect of COVID-19 related interventions.

Measures taken to control the spread of COVID-19 seem to have depressed the prices in the production areas especially during the month of March and April where all markets experienced prices lower that predicted prices. During the same period, the prices of maize in deficit areas were rising in most markets. The observed trend could be explained by the travel restrictions that decreased supply in the deficit areas where prices were rising while in surplus areas the prices were declining due to depressed demand. COVID-19 control measures inevitably created an artificial shortage in urban markets while at the same time creating excess supply in production areas. The actual maize price deviation from predicted prices in the 10 markets that were analyzed in this bulletin are summarized in Table 1.

Conclusions

Measures taken by the government to control and contain the spread of COVID-19 had unintended effects of disrupting the prices of maize which is a staple food in Kenya. As discussed in this bulletin, the containment measures made it difficult for maize to flow uninterrupted from production markets to consumption markets. The rising prices in deficit areas relative to predicted prices continued even into the month of July despite some relaxation of the initial measures. To cushion the most vulnerable people in urban areas, the government initiated a weekly stipend that was sent to them via Mobile money. Other measures included, removal of income tax of individuals earning a monthly income of less than Ksh 24,000 (USD 222) and reduction of maximum income tax rate from 30% to 25%. This was meant to increase disposable income of the population to cushion them against expected changes in the cost of living.

To better manage future shocks like COVID-19, it is critical to ensure minimal disruption in the flow of staple commodities from surplus to deficit areas. Furthermore, better informed targeting of areas for which to impose restrictions would help reduce large scale disruptions.

Table1 : Actual Maize price deviations from predictions (percent)

Area designation	Maize price behaviour	Market Name	Market Type	Pre-COVID restriction period (Jan-Mar 2020)	COVID restriction period (Apr- Jun 2020)	Post-COVID Restriction Period (July 2020)
Maize deficit areas	High increase	Nairobi	Retail/Urban	-7%	+4%	-9%
		Lodwar	Retail/Urban	-1%	+13%	+27%
		Nanyuki	Retail/Urban	-7%	+6%	+10%
		Kitui	Retail/Urban	-9%	+12%	+15%
	Moderate increase	Mombasa	Retail/Urban	-9%	+9%	+2%
		Kisumu	Retail/Urban	+4%	-1%	+6%
	Normal	Mandera	Retail/Urban	-1%	+2%	+2%
Maize surplus areas	Normal	Kipkaren	Wholesale/Rural	-6%	+1%	+3%
	Moderate decrease	Nakuru	Wholesale/Urban	-2%	+2%	-9%
		Eldoret	Wholesale/Urban	7%	6%	+10%

Key

V≥10%: High increase
5≤V<10: Moderate increase
- 5≤V<5: Normal
- 10≤V<-5: Moderate decrease

Reference

Taondyandé, M., Goundan, Odjo, S., and Yade, M., 2020. The Impact of the COVID-19 Pandemic on Staples Food Prices in Local Markets: The Case of Millet Markets in Senegal. Covid-19 Bulletin 003. AKADEMIYA2063, Kigali, Rwanda

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a: AKADEMIYA2063 | Kicukiro/Niboye KK 341 St 22 | 1855 Kigali-Rwanda
p: +221 77 761 73 02 | p: +250 788 304 270 | e: hq-office@akademiya2063.org | w: akademiya2063.org