AFEX

Kainosedge Consulting Limited

AFEX 2021
Commodities Outlook

Contents

Executive **Summary**

INTRODUCTION

The outbreak of the novel corona virus, COVID-19, in 2020 brought about some unprecedented shocks to the global economy. The effect of the pandemic was unique given its adverse impact on supply chains and global demand of commodities. The global commodities market saw prices of some global commodities like oil and metals plunged in the first half of the year before experiencing a rebound in the second half of the year.

For Brent crude oil, low demand amid supply glut saw prices slump 71 percent in the first four months of the year to $19.33 per barrel. However, price almost doubled since April's 5-year low, supported by sharp oil supply cuts by OPEC+ and gradual easing of lockdown measures across economies, reviving demand. The rebound in crude oil prices drove recoveries seen in Energy prices. However, the recovery in prices stalled in September amid renewed outbreaks of COVID-19 in some key economies.

For metals, especially copper, aluminum and iron ore, net gains in 2020 surpassed levels in 2019 driven by supply disruptions major producing countries and China's increased trade activities and metal demands for bridges, roads etc., spurred by huge stimulus packages aimed at spurring a V-shaped recovery for China's manufacturing sector.

For non-Energy commodities especially agricultural commodities, prices modestly trended downwards on lower demand for agricultural commodities. In the first seven months in 2020, global prices of agricultural commodities, especially Cocoa, Maize and Soybean saw prices plummet. Cocoa recorded the biggest decline by 19 percent. Maize by 11 percent and Soybean fell marginally by 2 percent according to World Bank Commodity Price Data (The Pink Sheet).

The Nigerian commodities space was likewise not immune to the ravaging impact of the COVID-19 pandemic amid some fiscal policies geared at boosting growth in the sector ahead of the commencement of the African Continental Free Trade Area agreement. Although reselient when compared with some other sectors of the economy, the agriculture sector suffered decelerated growths in the second and third quarters of the year 2020. Business activity growth slowed by 1.58 percent in Q2 as against 2.20 percent in Q1 and slowed further by 1.39 percent in Q3, respectively.

The outbreak novel virus played an especially important role in determining prices of commodities in the domestic market in 2020. The disruption in supply chain activities coupled with the effect of the border closure policy of the FG on prices saw prices of major food items surge during the period.

Although we expected more output across crops in 2019/20 wet season, our crop production survey revealed access to finance as a key factor affecting productivity for farmers despite increase in private organizations and other financial institutions' providing access to finance for farmers. Also, access to inputs (fertilizers, seeds and CPPs), although critical, was greatly limited.

We believe this provides a guide to policy direction and intervention in the Nigeria agriculture space. Meanwhile, land use, fertiliser usage and weather conditions were significant in determining output in 2020 across commodities surveyed as detailed in this report. Analysis of farmers responses captured in the survey informed our estimation for at least 4 percent increase in output in 2019/20 wet season period across surveyed commodities.

In 2021, we expect the global economy on the path of recovery given the announcement, approval, and distribution of COVID-19 vaccines and positive impact on the global commodities market in terms of higher prices. Also, the Joe Biden led administration looks positive for global trade.

Outlook for domestic commodities varies across crops but largely dependent on key systemic factors like outcomes of the COVID-19 outbreak, distribution of vaccines, fiscal and monetary policies and AfCFTA.

Review of Global Commodities Market in 2020

The outbreak of the COVID-19 pandemic in 2020 remained a major factor that shaped the global commodities market during the period amid a combination of political, environmental, demand and supply related factors. However, the effect of the global pandemic varied across commodities in the global space unlike the global recession in 2008-09, when almost all commodity prices saw large, and persistent, declines.

Being a unique shock with significant impact on both demand and supply sides of the global commodities market in 2020, consensus estimates for global GDP growth were gloomy with most advanced economies projected to suffer deep recessions. The International Monetary Fund (IMF) for instance, projected global growth at –4.9 percent in 2020, 1.9 percentage points below the April 2020 World Economic Outlook (WEO) forecast.

Economies suffered weaker growth which also resulted in reduced demand for commodities. This saw prices of most major commodities fall since January 2020, led by Oil which experienced significant slump by approximately 71 percent to a 5-year low of $19.33p/b in the first four months of the year.

Prior the outbreak of the COVID-19 pandemic in the fourth quarter of 2019, prospects for commodity prices were already muted on the back of rising trade tensions between US-China and slow growth in China which affected demand negatively despite commodities glut.

Agriculture commodities however experienced muted or marginal plummet in prices given the importance of such goods to livelihood. However, food security concerns have been raised in most economies, especially frontier and emerging economies given disruptions in food supply chains which has resulted in higher prices of commodities at the consumer level from hoarding and lower prices at the producer level from ample harvest amid low demand.

More so, shortages of available inputs resulting from mitigation measures, limited labour force on farmlands due to movement restrictions instigated downward revisions for some commodities output in 2020.

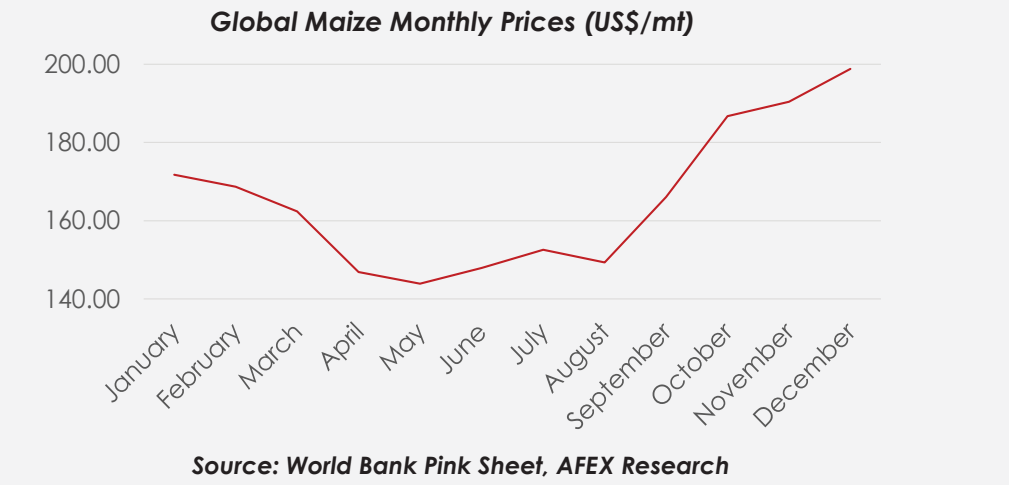
Global Grains Price **Performance**

MAIZE

The price of Maize weakened by approximately 3 percent to $165.5/MT in 2020 year-on-year (Y/Y) but increased slightly at a compounded annual rate of 0.3 percent according to data computed from the World Bank Commodities Price Data (The Pink Sheet). In 2020, prices were largely muted, growing at a Compounding Monthly Growth Rate (CMGR) of 1 percent to close the year at $198.77/MT.

The first nine months was bearish, shedding 6 percent from $171.79/MT to $166.8/MT following lower demand in the US induced by weak crude oil prices, reduced fuel demand and reduced ethanol demand amid large global supplies of Maize. However, prices rebounded in the third quarter to maintain a positive trajectory.

Massive demand from China, in a bid to ramp up its hog population and also cover for the domestic production shortfall will be one of the significant price determinant in 2021. Also, unfavourable growing conditions in South America, a major producing region, following current La nina weather event will affect supply amid revived demand, hence, pressure up prices further in 2021.

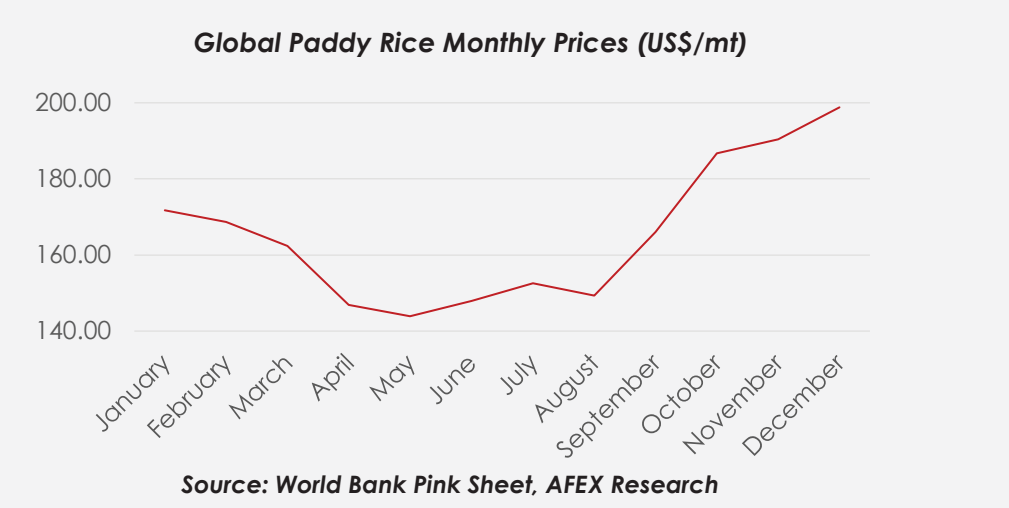


PADDY RICE

International price of Paddy Rice, Thailand 5% rose sharply in the first half of 2020 to a 7-year high at a quarterly average of $531.3/MT in Q2 2020. In 2020, prices rose at a CMGR of 1 percent to close the year at $520.

A 19 percent surge in prices from an annual average of $418/MT in Jan-Dec 2019 to an annual average price of $496.75/MT in 2020 was driven by adverse weather conditions in Thailand – the second largest exporter of Rice after India – which affected production, hence, supply. More so, export restrictions across rice producers in response to the outbreak of the COVID-19 pandemic drove prices up initially in Q12020.

Improved growing conditions in major producing regions like Thailand and India, relaxation of export restrictions in 2021 amid positive outlook for COVID-19 vaccines; are expected to further improve supply of Paddy, weighing on prices of the commodity.

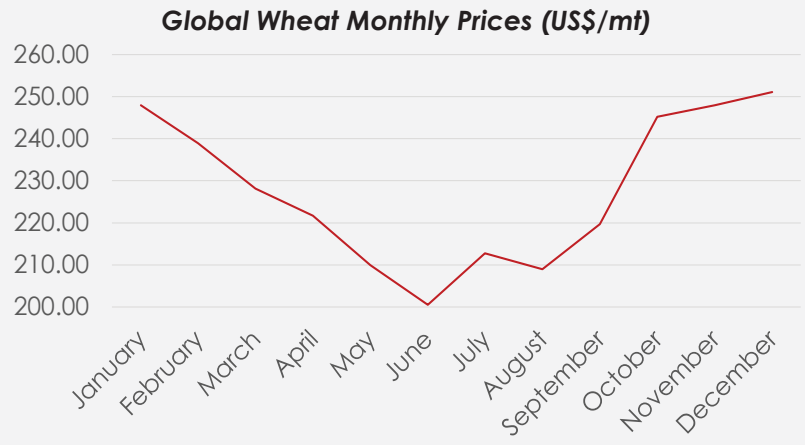


WHEAT

Global wheat prices halted an 8-month bearish trend settling at $251.15/MT in Dec 2020 with a YTD performance of 1 percent. Monthly, prices rose slightly at a CAMR of 0.1 percent.

The bearish trends in prices witnessed in the earlier months followed upward crop revisions in Australia, the EU, and Russia, due to favourable growing conditions. However, drought concerns in Ukraine and frost in Argentina saw prices gain momentum in Q4 2020. The commodity closed the 2020 calendar with prices averaging $211.3/MT, 8 percent up from 2019 average prices, marking a 3-year high.

Global consumption is expected to grow slightly less than 1 percent, pushing the stocks-to-use ratio to 0.43, the highest level in over two decades according to World Bank's commodity markets outlook. Hence, we expect price to move upwards slightly to reflect higher demand.



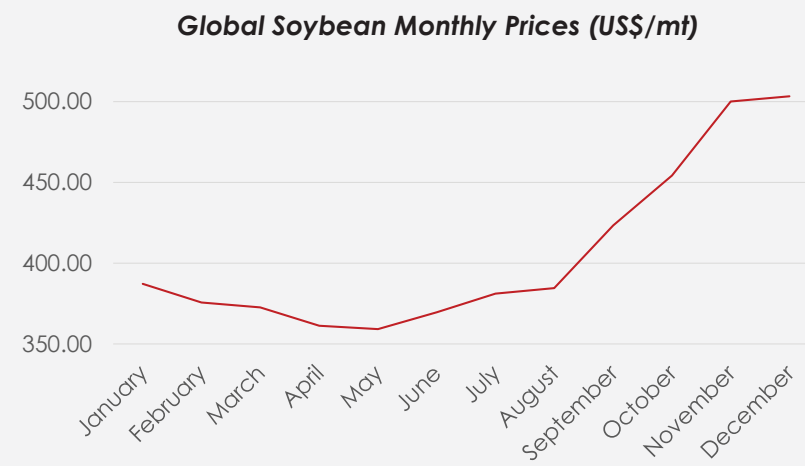
Source: World Bank Pink Sheet, AFEX Research

SOYBEAN

Soybean was largely bullish in 2020 recording a YTD performance of 30 percent which saw prices settle at $503.30 in Dec. Prices rose at a CMGR of 2.4 percent. Average prices of Soybean ($406/MT) in 2020 was 10 percent higher than 2019 price.

The higher prices reflect the previous season's production shortfalls in soybeans and China's (the largest importer of Soybean) feed demand following the recovery from the African Swine Fever.

The US-China trade war is expected to dominate soybean trade flow and prices in 2021 coupled with revived Chinese demand for Soybean.



Source: World Bank Pink Sheet, AFEX Research

Global Commodities Market **Outlook**

We expect prices in the global commodities market to remain bullish in the new season as COVID-19 vaccines distribution amid a second wave of the virus could bring respite to a hobbled global economy, spurring demand for commodities.

Commodity prices continue to surge in December, with energy commodities spiking 15 percent and non-energy commodities jumping 4.7 percent according to data by the World Bank (Pink Sheet). All sub-indexes rose, led by metals and minerals (10.4%), base metals (7.2%), and grains (3.8%). Precious metals and beverages registered the smallest gains.

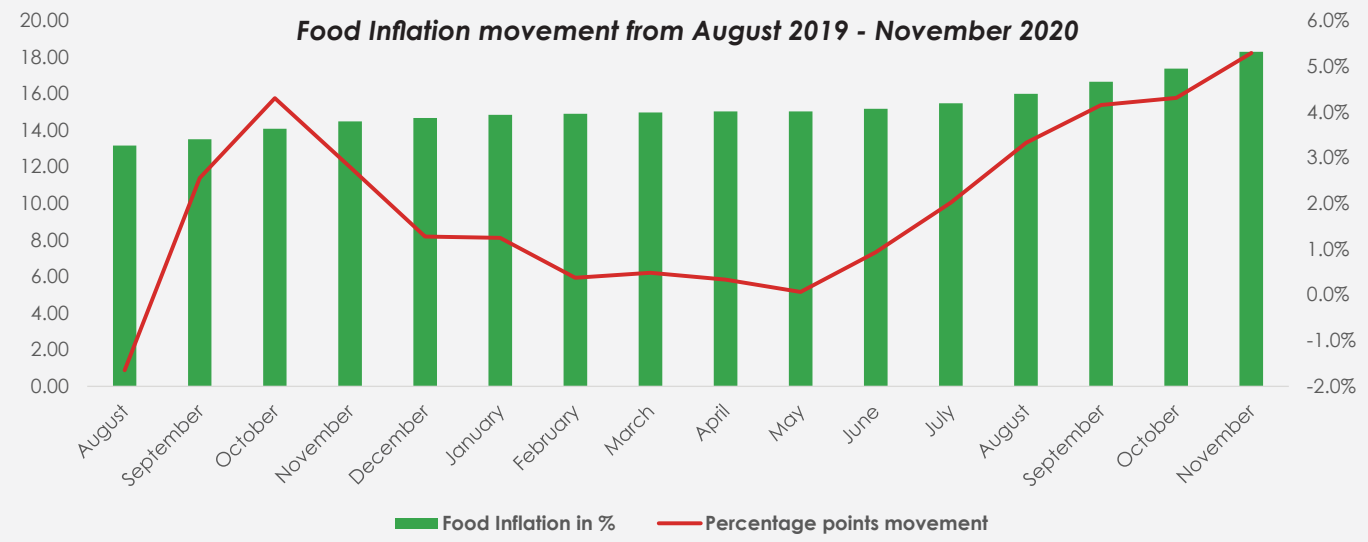
Also key in determining the performance of the global commodities market is the lingering US-China trade war in the coming quarters. Following the trade truce reached between presidents Donald Trump and Xi Jinping on the side-lines of the G20 summit in June 2019, the US and China now face a long period of trade talks.

Periods of de-escalation and re-escalation of tensions are likely to remain the norm, prompting further volatility for commodities, whether from a price or actual trade flow perspective.

Review of Domestic Commodities Market in 2020

The outbreak of the COVID-19 pandemic was the major highlight of the year 2020 especially for the Nigerian commodities market. Its impact on Nigeria has been regarded as the worst shock to the economy in the last decade. The heavy reliance of the country on a volatile oil market which over the years contributes more than 90 percent of foreign exchange earnings to her gross foreign reserves saw the economy enter its deepest recession in 2020 after the pandemic caused the oil price to plummet sharply to less than $20 per barrel in the first half of the year.

The food commodities market remains the major driver of the Agriculture economy owing to its crop production activities which accounts for 92 percent of the Agricultural sector GDP. Growth in the sector slowed, averaging 1.73 percent in the first three quarters of 2020 against 2.54 percent in the corresponding period of 2019.



Source: NBS, AFEX Research

While it was imperative for policy makers to take necessary actions by imposing lockdown measures across states in a bid to control the spread of the COVID-19 virus, the policy was however, at a cost to the commodities market.

On the supply side, many farmers during the period could not get to their fields, affecting production nationally. Also, access to market was difficult for these farmers. While adequate storage facilities remain a challenge in Nigeria, most small-scale farmers did not have storage facilities to store their commodities, hence, watched their fruits and vegetables spoil or were forced to sell cheap.

On the demand side, compulsory lockdowns saw demand of commodities largely weighed on as prices of commodities increased marginally to reflect disrupted supply activities during the period. This is evident in the National Bureau of Statistics (NBS) inflation numbers. Despite inflationary pressure on food commodities kicked in September 2019, halting a 3-month price decline, increase in prices decelerated to an average of 0.7 percentage points between January and June 2020. Renewed demand however after lockdown were eased saw food prices accelerate faster to see food inflation hit a 34-month high in November at 18.30 percent.

The Nigerian commodities market is largely informal with trades mostly executed in the open market. For the commodities traded, grains (Maize, Paddy Rice, Sorghum) and oilseeds (soybeans) remain the most liquid and tradable commodities with almost year-round demands necessary to stimulate trades, hence, constitutes the AFEX Commodities Index(ACI). Also export commodities such as Cocoa and Ginger have also been identified as tradeable commodities meeting the liquidity criteria for inclusion in AFEX Export Index(AEI).

Domestically, maize and soybeans remain the most liquid commodities owing to the diverse use of the commodities across industries in the country. Despite the historical importance of cocoa, trades have declined significantly with the international market spurring the greater proportion of trades. In addition to the three commodities mentioned, sorghum, paddy rice, sesame and ginger have become economically important as the increased demand by industrial users: locally (Sorghum and Paddy rice) and internationally (Sesame and Ginger) prompt the attention of stakeholders along the value chain.

Under the production dynamics employed in Nigeria, (Rainfed Agriculture), the supply of the commodities into the market is seasonal with periods when trades are highest, causing price swings mirroring the forces of demand and supply in the open market, and period with little or no trade, hence causing muted prices.

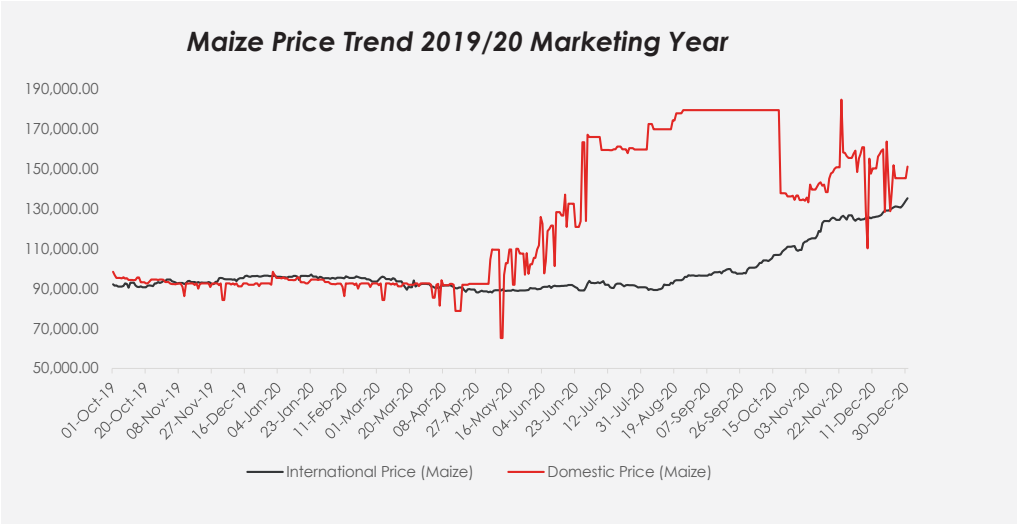
The local commodity markets are disproportionately skewed towards the Northern region of the country where most of the supply of annual crops emanates. This skewness, although not absolute for all commodities, positions the region as the focus of commodity trading activities in the country. Besides, the local market helps to serve the trans-Saharan trading routes to neighbouring countries. Also, the demand side of the local commodities market is largely skewed towards the South Western region of the economy with the commercial hub (Lagos State) leading the chart.

Domestic Commodity Price **Performance**

MAIZE

The 2019/20 marketing year posed varying outcomes for the maize commodity market. Excess supply of Maize amid low demand induced by lockdown measures pushed price to a season low at N65,211.73 in May 2020. Prices of Maize in the first 8 months of the 2019/20 trading season were bearish averaging N93,017.79 when compared to a bullish trend witnessed in the last four months of the season when prices averaged N155,691.92.

Season to Date performance of Maize stood at 113 percent, indicating an increase from N84,500 to close the season at N179,666.22. At this price, Maize clinched a 4-year high. Through the season, price movements also witnessed daily volatility of 7 percent.



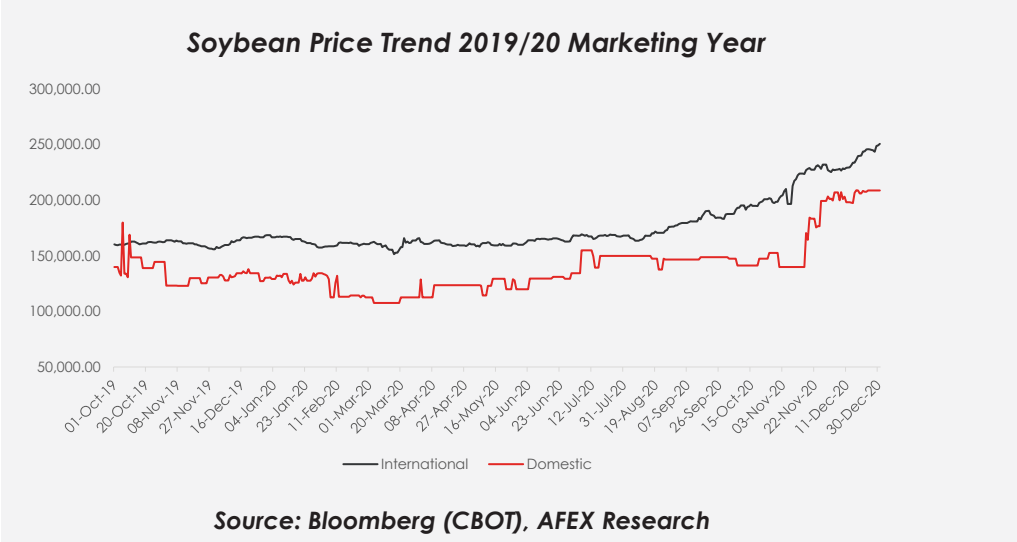
Source: Bloomberg (CBOT), AFEX Research

SOYBEAN

The 2019/20 season saw a 6 percent season-to-date performance with a daily volatility of 4 percent. During the period, prices averaged N131,683.75 reaching its season low in March 2020 at N107,667/MT of Soybean and peak price of N169,000 on the tenth trading day of 2019/20 season.

At the end of the 2019/20 trading season for Soybean, price settled at N148,833/MT after it remained muted in the last 12 trading days of the season.

In comparison with domestic prices, international prices outperformed with a 16 percent increase in prices season-to-date. Also, prices in the international market for soybean recorded a 1 percent daily volatility as against 4 percent in the domestic market.



Source: Bloomberg (CBOT), AFEX Research

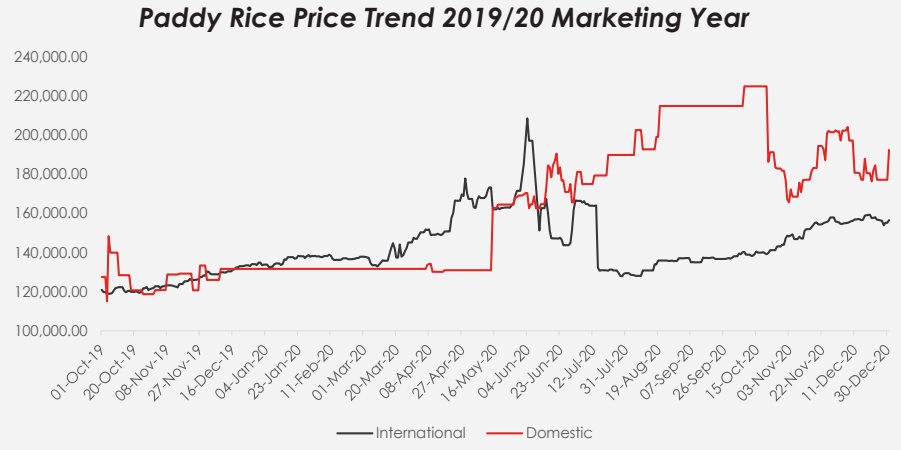
PADDY RICE

A trend analysis of the domestic market for paddy rice revealed daily prices were modestly volatile in the first 3 months of the 2019/2020 season at 4 percent. During the season, prices of Paddy Rice were mostly muted reflecting low demand of rice during COVID-19 induced lockdown periods.

Prices of paddy rice rose to a peak of N215,000 in August 2020 shortly after lockdown measures were eased reflecting higher demand for the commodity. However, prices remained flat for the rest of the season.

Intra-season volatility, as measured by the standard deviation of prices reached 2.6% during the season. Season-to-date performance of the domestic market for paddy rice stood at 69 percent, outperforming international prices which grew 13 percent during the same period. In the international market, prices reversed gains after reaching a season high of N208,603.36. During the period, concerns around export restrictions saw in response to the ravaging effects of the COVID-19 pandemic on economies, saw prices rice in the first half of the year 2020. However, Thailand's refusal to restrict export, coupled with supply gluts amid weakened demand forced downwards international price for rice.

Spreads between the international price and domestic price widened considerably, averaging N54,670 in the second half of the year 2020.

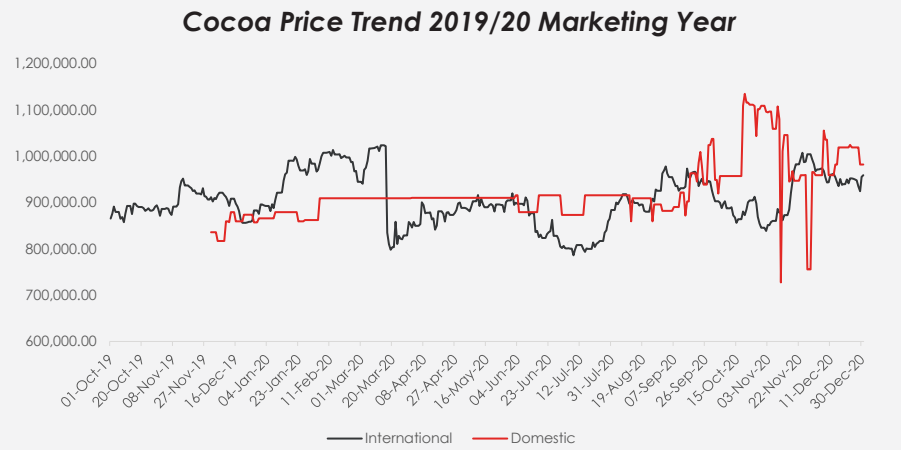


Source: Market Intelligence, AFEX Research

COCOA

All through the 2019/20 marketing year, cocoa prices remained largely favorable for local exporters with a season-to-date performance of 24 percent, outperforming international price during the same period. International prices settled at N927,004.63 after appreciating by 2 percent STD.

Domestic prices reached a season high of N1,037,532.85 in September 2020 owing to increased demand following the light crop harvest which ran from May to September 2020. Intra season volatility was low at 1 percent against a 2 percent volatility in the international market.

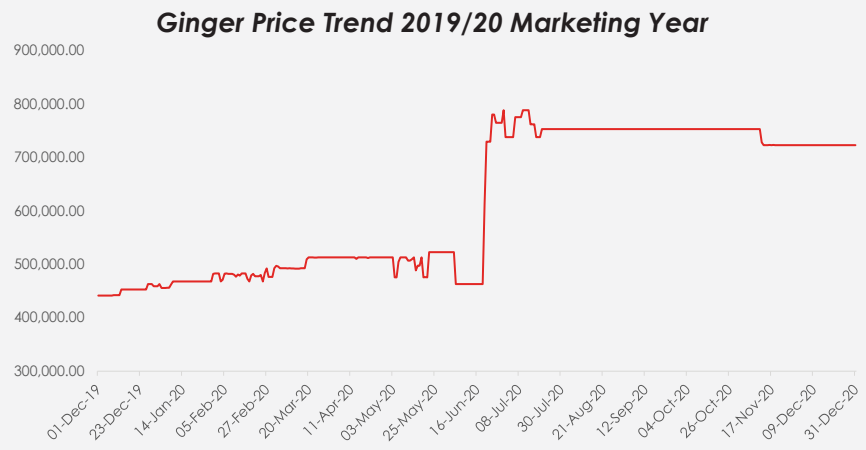


Source: ICCO, AFEX Research

GINGER

Ginger production in Nigeria is catching up to be included in the mainstream root crops produce in the country. The growth in production has been largely fueled by the profit levels attainable and the export perspective of the demand elements. During the 2019/20 trading season, saw prices of Ginger surge by 64 percent from N441,283 as at Dec 2019 to N722,670 as at Dec 2020. Daily volatility was low at 2 percent. COVID-19 induced disruption in the export space saw muted activities in Ginger majorly in the first half of 2020. However, prices peaked in Q2 following buy pressures by aggregators who majorly have warehouses and collection centers near the farmer communities.

We expect demand for Ginger to be higher than supply in 2021 spurred by revived export activities with attendant flight of prices.



Source: AFEX Research

SORGHUM

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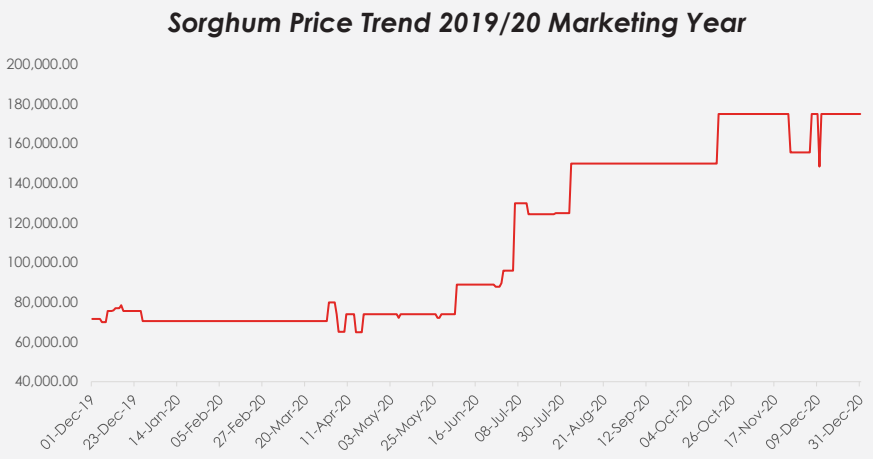


Source: AFEX Research

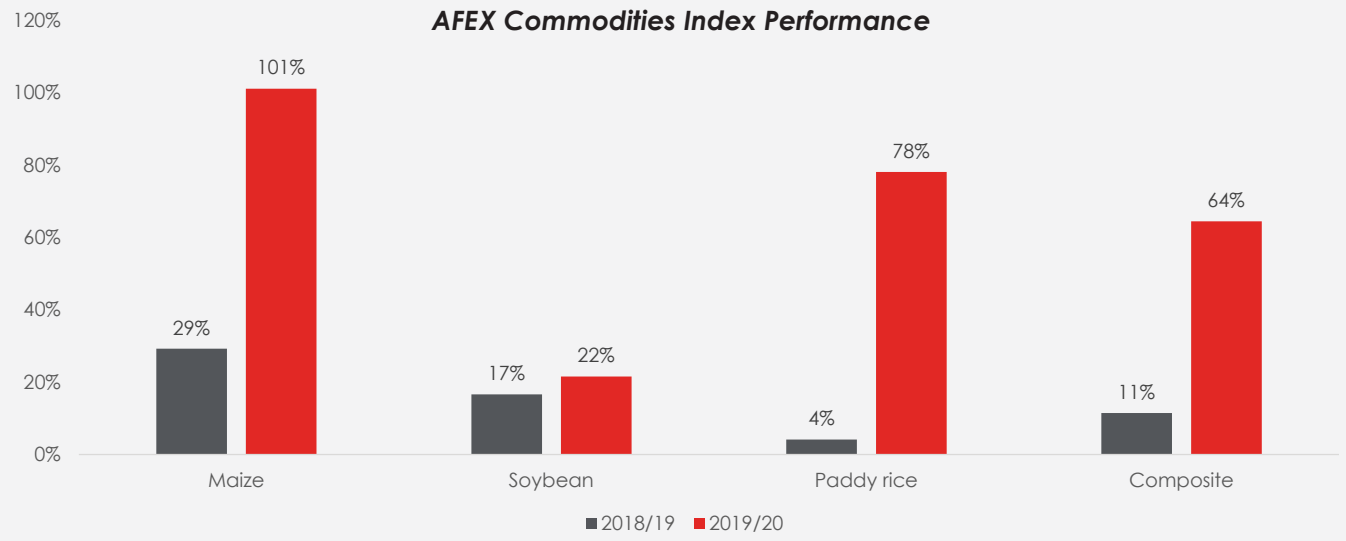
AFEX Commodities Index Performance 2020 vs 2019

The 2019/20 season saw increased returns to investors on the AFEX Commodities Index (ACI) as commodities captured in the index outperformed the corresponding season of 2018/19.

Maize topped the chart as the Maize index grew by 101 percent Season-to-Date against 29 percent growth in the previous trading season. Across commodities, Maize remained the most volatile commodity during the season, however, compensated risk loving investors with higher return.
Following closely was the Paddy Rice index which appreciated by 78 percent from a 4 percent increase in the 2018/19 trading season. Among factors that drove the performance of the index is the quest of the federal government to boost local production of commodities, especially rice which led to the closure of the land borders in August 2019.

Also, other factors like the easing of lockdown measures in the second half of the year 2020 increased demand for rice amid low supply coupled with the logistical constraints in delivering grains to willing buyers contributed to the massive rally in prices of commodities.

The Soybean Index also recorded a 22 percent appreciation STD, outperforming gains recorded in the previous trading season. Tracking all commodities traded on the AFEX Exchange, the ACI grew by 64 percent during the season again 11 percent in the previous season. Across commodities, performances were above inflation figures which averaged 12.42 percent during the 2019/20 trading season, returning positive real returns to investors.



Source: AFEX Research

2020 Crop Production Wet Season Survey and 2021 **Outlook**

AFEX 2020 wet season crop production survey aimed at providing relevant information regarding the estimated production volumes for selected commodities in Nigeria. It also details factors affecting the yield of farmers for the reporting season ranging from government policies, the adoption and use of modern agricultural best practices by farmers, access to credit etc.

Given the need to boost private capital in the agricultural space and open the Nigerian agriculture sector to long term financing opportunities in the Nigerian capital market, key information which are detailed in this report are important to drive the performance and growth of the sector overtime. Capital market players often hesitate to take position in the agricultural sectors in Nigeria due to the lack of relevant information to measure the riskiness of the sector.

62.5 percent of farmers were identified to fall within the 26-45 age bracket with experience ranging from 11-15 years and most cultivated between 2-5ha of farmland during the 2020 wet season. Across 4 major crops surveyed, the report reveals that all farmers cultivated at least 2 crops with approximately 75.6 percent of all farmers having maize in their mix and 54.20 percent having Paddy Rice in their mix.

The report also firmly established that across all four commodities surveyed, the land use, fertilizer usage and weather conditions played a significant role in determining output during the 2019/20 wet season cultivation.

From our survey, 62 percent of farmers surveyed were able to access input finance from private companies in 2020, making private companies the top providers of finance to farmers among other sources like Government, Corporative etc. This is majorly driven by the role Capital Market Operators such as AFEX Commodities Exchange are bridging the financing gap through establishment of robust infrastructure and leveraging on innovative solutions.

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Crop Production **Analysis and Report**

MAIZE

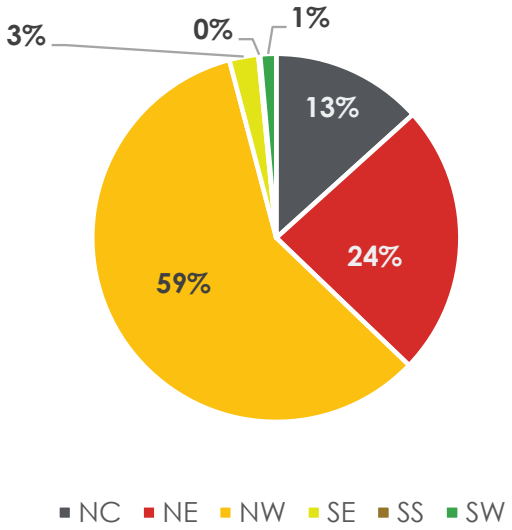
Following results from our crop production survey for 2019/20 wet season, 75.67 percent of Maize farmers surveyed reported to have included Maize in their crop mix for the period under review. Across regions, farmers who cultivated Maize were more concentrated in the North Western region of the country, accounting for 59 percent of total maize farmers.

Approximately 41 percent of farmers reported to have allocated more land to the cultivation of Soybean during 2019/20 wet season when compared to corresponding period of 2018/19 wet season. Our estimates show that total land cultivated by surveyed Maize farmers in the 2019/20 season increased by 7 percent from 10,050Ha in 2018/19 to 10,775Ha.

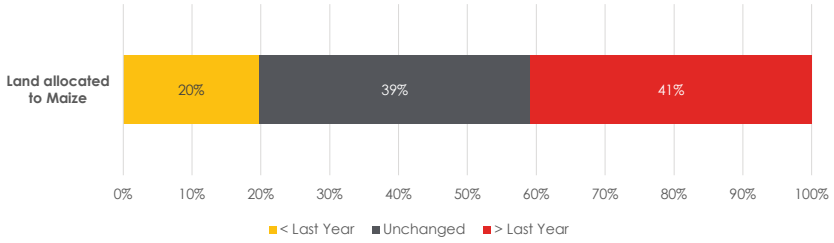
In estimating output for the 2019/20 wet season, our study identifies land allocation, fertilizer usage and weather condition i.e., rainfall as major drivers of output during the period under review. Analysis revealed that about 43 percent of farmers reported to have used lesser amount of fertilizers when compared to corresponding period of 2019.

The North Eastern region and the North Western region have been identified as a major producing region of Maize. During the season, farmers in North East reported rains were not favorable while this was not the case for North Western farmers.

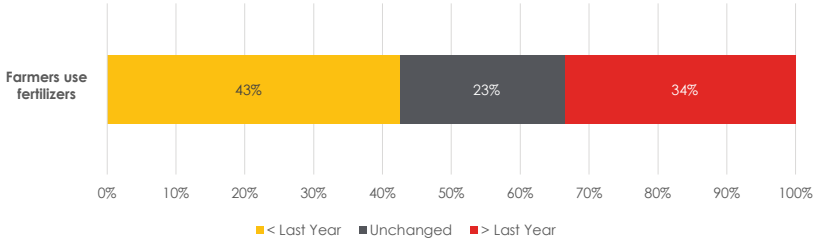
Share of respondents who cultivated Maize by Region



Respondents' allocation of farmland to Maize in 2020 compared to 2019



Respondents' use of fertilizer to Maize in 2020 compared to 2019



Source: AFEX Survey

Output Estimation

Our analysis revealed that land usage and fertilizer usage have a positive relationship with output while there exists a negative relationship between unfavorable weather condition and output during the period. Favorable weather conditions had a positive relationship with output. An additional allocation of land to the cultivation of Maize will see output increase by 238.38Kg. Also, a unit increase in the amount of fertilizer used will see output increase by 48.28Kg. Holding other factors constant, unfavorable weather conditions will see decline by 508.7Kg and up by the same magnitude if weather conditions are favorable.

Therefore, our estimation for output in the season under review show Maize output to increase by c.8 percent from 8,442,503Kg to 9,136,679Kg given farmers increase the significant impact of land usage and favorable weather conditions in the North West which has most maize farmers concentrated.

2021 Maize Price Outlook

Maize prices slumped 17 percent between October and December 2020 from N179,666 to N148,807 as the market was awash with late Maize which was harvested in October 2020. However, increased purchase by institutional buyers for the commodity has seen prices surge, settling at an 8-month high of N185,000 as at January 14th 2021.

Going forward, we expect prices of Maize to be pressured up prior next harvest in May 2021 after the supply of late maize may have been exhausted in the market coupled with aggressive demand by industrial users.

The consistent devaluation of the naira after supply of the greenback dried up due to a COVID-19 induced plunge in oil prices in May 2020 to $19.99/b also supports pressured prices for maize. More so, we do not see the CBN rescinding its ban on maize importation. With existing supply gap in the Nigerian maize market, we maintain our stance on higher prices for maize in current trading season.

SOYBEAN

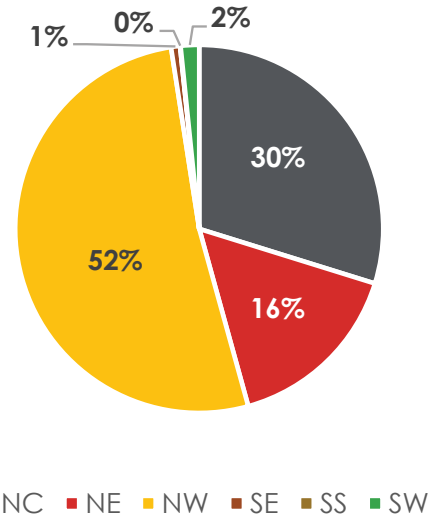
Following results from our crop production survey for 2019/20 wet season for Soybean, 33.90 percent of farmers surveyed reported to have included Soybean in their crop mix for the period under review. Across regions, farmers who cultivated Soybean were more concentrated in the North Western region of the country, accounting for 52 percent of total Soybean farmers.

Approximately 41 percent of farmers reported to have allocated more land to the cultivation of Soybean during 2019/20 wet season when compared to corresponding period of 2018/19 wet season. Our estimates show that total land cultivated by surveyed Soybean farmers in the 2019/20 season increased by 7.5 percent from 3,615.42Ha in 2018/19 to 3,887.13Ha.

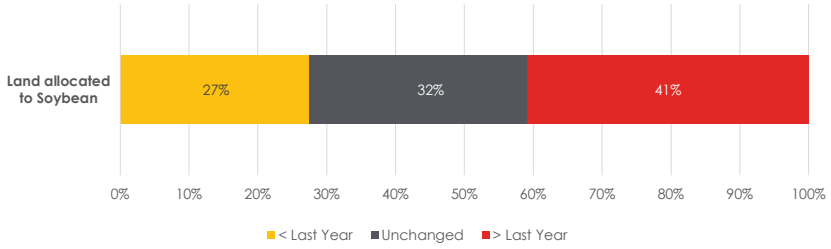
Unlike Maize, 47 percent of Soybean farmer reported to have increase the usage of fertilizers as against 35 percent of farmers who used less when compared to the corresponding period of 2018/19 season.

Being largely produced in the Northern Region of the country, 80 percent of farmers in the region reported to have had favorable weather condition during planting season for Soybean. These farmers were found in North East, accounting for 29 percent of total responses and North West accounting for 71 percent. Meanwhile, farmers in the North Central region reported otherwise, accounting for 20 percent of responses from the Northern region.

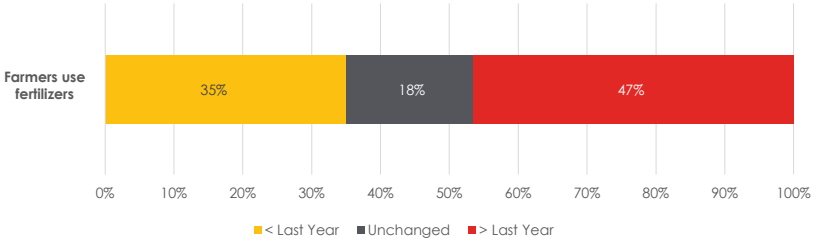
Share of respondents who cultivated Soybean by Region



Respondents' allocation of farmland to Soybean in 2020 compared to 2019



Respondents' use of fertilizer for Soybean in 2020 compared to 2019



Source: AFEX Survey

Output Estimation

Our analysis reveals that across all explanatory variables (Land use, input use and weather conditions), there exist a positive correlation with output during the period under review with statistical significance. According to relationships identified, a unit increase in land cultivated for Soybean will see output increase by 719.63Kg. Likewise, a percentage increase in the usage of fertilizers will increase output by 1,309.48Kg. Weather conditions revealed a stronger positive relationship increasing output by 2,224.35Kg. However, holding all variables constant, output is estimated to decline by 448Kg.

Therefore, we estimate Soybean output to increase by c.5 percent from 4,551,418Kg to 4,803,220Kg driven by the significant impact of fertilizer usage and favorable weather conditions in the North West and North East during the 2019/20 wet season.

2021 Soybean Price Outlook

Few months into the 2020/21 season, Soybean prices as more than doubled by 53.19 percent, settling at N228,000 as at the second trading week of January 2021 from N148,833.33 in December 2020.

Price movement has recorded a daily volatility of 3.74 percent signifying low swings in prices of Soybean, reflecting the interplay between the demand and supply forces

The surge in prices of Soybean despite during the harvest season which starts late October is reflective of the supply deficit in the market amid growing demand of the commodity in the poultry and aquaculture sectors of the country. Nigeria's annual average production of Soybean is about 680,000 tonnes, nearly 25 percent of the country's national demand of 2.7 million tonnes. Nigeria will increasingly continue to depend on imports to satisfy this growing demand.

However, we expect demand for domestically produced Soybean to push prices further northwards given the higher cost of importing Soybean. The import parity of for Soybean is $1,023/MT as against $502.51/MT domestically.

This will weigh on the possible effect of the commencement of African Continental Free Trade Area agreement, opening of the land borders on prices in 2021.

PADDY RICE

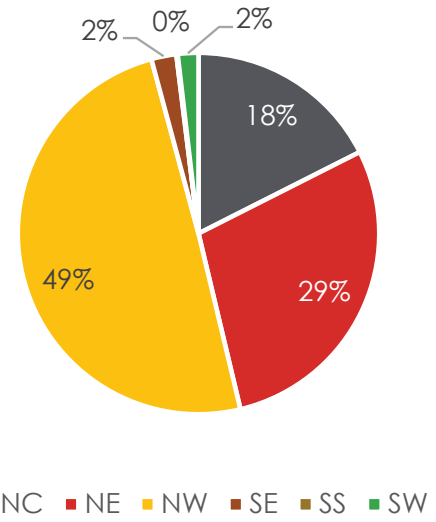
Following results from our crop production survey for 2019/20 wet season for Paddy Rice, 54.22 percent of farmers surveyed reported to have included Paddy Rice in their crop mix for the period under review. Across regions, farmers who cultivated Paddy Rice were more concentrated in the North Western region of the country, accounting for 49 percent of total Paddy Rice farmers.

Fifty-three percent of farmers reported to have allocated more land to the cultivation of paddy rice during 2019/20 wet season when compared to corresponding period of 2018/19 wet season. Our estimates show that total land cultivated by surveyed paddy farmers in the 2019/20 season increased by 7.3 percent from 5,566.27Ha in 2018/19 to 5,972Ha.

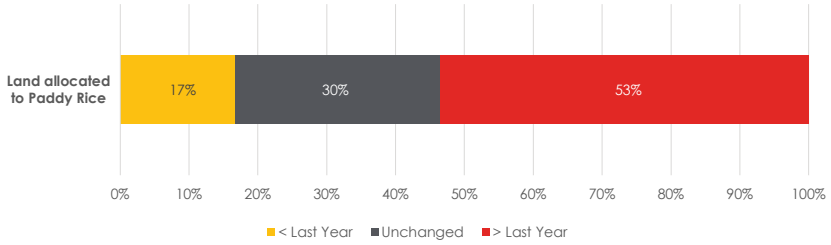
During the period under review, we saw almost an equal share of farmers who reported using more or less fertilizers in 2020 as against 2019. However, farmers who used more fertilizers were a percent more.

Farmers in the North Western period of the country responded that rains were not favourable during planting season of paddy rice hence affected production of the commodity. In North Central, farmers responded that rains favoured production of paddy rice in the region during the period under review. Unfavourable weather responses accounted for 77 percent of total responses while favourable, 23 percent.

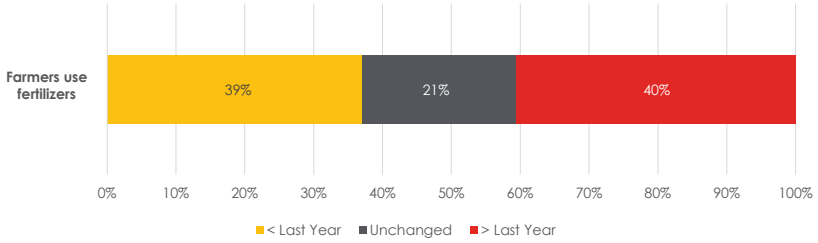
Share of respondents who cultivated Paddy Rice by Region



Respondents' allocation of farmland to Paddy Rice in 2020 compared to 2019



Respondents' use of fertilizer for Paddy Rice in 2020 compared to 2019



Source: AFEX Survey

Output Estimation

Our analysis reveals that across all explanatory variables (Land use, input use and weather conditions) considered, there exist a positive correlation with output during the period under review with statistical significance. According to relationships identified, a unit increase in land cultivated for Paddy will see output increase by 162.28Kg. Likewise, fertilizer usage had a larger effect on output. A percentage increase in the usage of fertilizers will increase output by 386.9Kg. Weather conditions showed a positive relationship increasing output by 211.6Kg. However, holding all variables constant, output is estimated to increase by approximately 1,397Kg.

Therefore, we estimate paddy rice output to increase by c.7 percent from 5,815,006.25Kg to 5,458,288Kg.

2021 Paddy Rice Outlook

Prices of paddy rice has been relatively muted in the first 3 months of the 2020/21 season with 6.14 percent daily volatility. Demand pressure for the commodity amid border closure and festive period drive saw paddy rice prices settle at N192,500 at the end of December 2020.

Following the renewed drive of policy makers to boost local production of the commodity which led to the closure of the land borders despite supply shortfalls, prices of paddy rose sharply during the 2019/20 trading season, hitting a season high of N215,000 in August 2020. Price trended upwards further as at the start of the new season to hit a new high of N225,000 in October 2020. However, we saw prices plunge by 14.44 percent shortly after Mr. President ordered the re-opening of four land borders in preparation for AfCFTA.

Despite policies aimed at boosting production in the rice sector, there still exist a supply deficit of about 2.5 million metric tonnes. Import parity for paddy rice is $520/MT compared to $468.96/MT in the domestic market at I&E window rate. Hence, we expect prices of paddy rice to rise moderately despite the reopening of Nigeria's land borders. Amid the weakening purchasing power of households, a resultant effect of inflationary pressure and weakening Naira against dollars, we do not envisage a significant effect on demand and ultimately price given paddy rice a major staple in Nigeria.

While the drive of the FG to boost local production of rice through various schemes and financing channels is still on-going, they expect a longer term effect on prices.

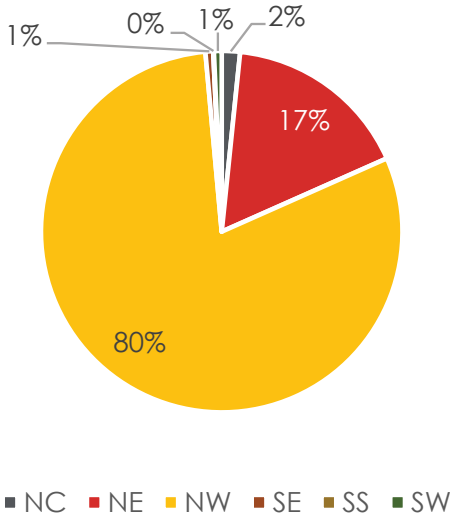
SORGHUM

Following results from our crop production survey for 2019/20 wet season for sorghum, 26.47 percent of farmers surveyed reported to have included sorghum in their crop mix for the period under review. Across regions, farmers who cultivated sorghum were more concentrated in the North Western region of the country, accounting for 80 percent of total Sorghum farmers.

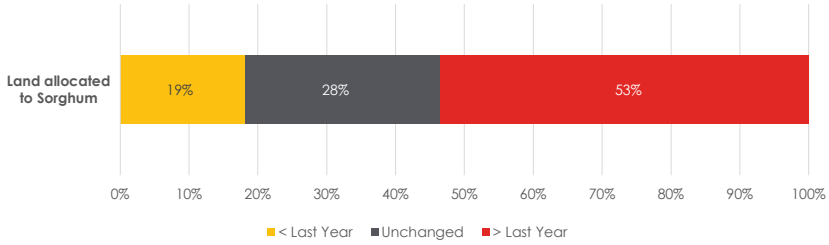
Our survey further revealed that 53 percent of Sorghum farmers, allotted more land to the cultivation of Sorghum for the period under review when compared to land used in 2019. However, 28 percent of farmers used same hectares while 19 percent used less hectares in 2020 as against 2019. Total land used during the 2019/20 wet season based on our estimations shows an increase by 2 percent from 2,103.53Ha in 2018/19 wet season to 2,154.38Ha.

Rains were favourable during planting and harvest seasons for Sorghum according to responses collated from farmers majorly from the North West region.

Share of respondents who cultivated Sorghum by Region



Respondents' allocation of farmland to Sorghum in 2020 compared to 2019



Source: AFEX Survey

Output Estimation

The impact of land use on output showed a positive correlation, explaining a unit increase in land will see output during the season increase by 202.81Kg. Similar behaviour was seen in the impact of fertilizer usage and weather conditions on output. A percentage increase in fertilizer usage will increase output of Sorghum by 138.32Kg while favourable weather conditions will increase output by 176.77Kg, respectively.

Modelling for the impact of identified explanatory variable on Sorghum output, we estimate production to increase by 4.7 percent from 2,151,500Kg to 2,254,633.75Kg during the 2019/20 wet season.

2021 Sorghum Outlook

Prices of Sorghum appreciated by 16.67 percent in the first three months despite low daily volatility of 2.69 percent, closing at N175,000 at the close of trading 31st December 2020.

A major driver of Sorghum output in the 2020/2021 trading season will be weather conditions during the period. The 2019/2020 period saw favourable weather conditions during Sorghum planting season and significant in determining output for the season.

The downside, however, is a tempered demand environment as Alcohol and beverage industry, which serve as the highest demand source have remained lethargic in mopping up supplies as we have in other crop value chains like maize and soybeans. This will see inventory levels higher this year as demand agents hold back on the procurement drive.

Systemic Factors Affecting Crop Production

In Nigeria, several factors affect the production of crops in key producing regions. Over the years, these factors have impeded the nation's quest to attain food security and earn sizeable FX from export commodities in other to diversify the economic from a highly volatile oil market. Despite several government intervention programs in boosting the agriculture sector and increasing farmers productivity, growth in the crop production sub-sector has remained snail-paced despite accounting for over 90 percent of the agriculture GDP.

A. RAINFALL

Agriculture is by far the most significant user of water resource (UN Research, 2009). Agriculture has faced obvious challenges and the foremost problem of the sector in Nigeria is that it is still largely informal, subsistent, rain-fed, and lacking mechanisation. The effect of rains in 2020 was different across crops planted during their seasons especially on Maize, Paddy Rice, Sorghum and Soybeans.

The North Western Region of the country recorded higher amount of rainfall in 2020 compared 2019. However, other regions experienced lesser rains compared to 2019 as farmers experienced little delay in the commencement of rainfall across in 2020. The South Southern and South Western regions experienced uneven distribution of rains during the year amid reports of flood in some other states like Benue, Jigawa etc. A report by National Agricultural Extension and Research Liaison Services (NAERLS) revealed that all local governments areas (LGA) in the Southwest experienced cessation of rainfall between June and August within the year.

According to responses from AFEX field officers, Maize farmers experienced adequate rainfall during the planting season this year and the rains lasted long enough across different types of maize for farmers to get the best of outputs from the crop especially in the North Western Region where the production of Maize is largest. Harvest in 2020 was favourable unlike in 2019, despite favourable rains, heavy and persistent rains disrupted drying period for their maize crops hence, affecting the quality of their output.

This was a different story for paddy rice farmers especially in the North-Western part of the country. In the third quarter of the year, floods across North-West Nigeria destroyed 90 percent of the two million tons that Kebbi state officials expected to harvest in autumn. This is according to the head of the state branch of the Rice Farmers Association of Nigeria. The loss amounts to some 25 percent of the rice Nigeria grew in 2019, and the waters are still rising. States like Jigawa and Nasarawa are not exempted. Most rice farmers in Nigeria cultivate paddy on in lowlands, especially in wet soil zones given its resistance to drought but also susceptible to floods during persistent rains. However, AFEX field officers in the North Central Region of the country reported different stating that the rains were favourable during the rice season just like they had it last in 2019.

In 2020, Soybean farmers in major producing states in the North Central complained about a sudden stop in rains during planting season, affecting the quality, sizes, and harvest of the bean. However, farmers in the North West region reported the rains were favourable in 2020 and expect more output as against 2019. These regions are important given combined production accounting for 82 percent of national production.

The planting season of Sorghum was favourable for farmers given adequate rainfall during the period. Hence, farmers output expectation of Sorghum is rather optimistic.

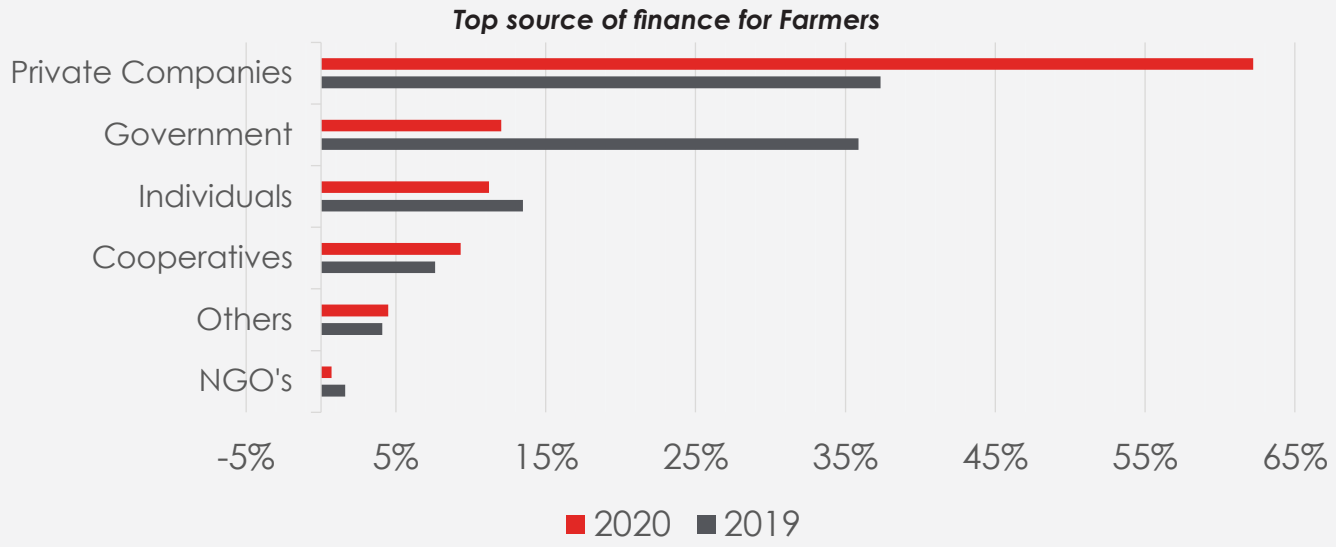
B. FINANCE AVAILABILITY AND ACCESSIBILITY

From our survey, more farmers were able to access input finance from private companies in 2020, making private companies the top providers of finance to farmers among other sources like Government, Corporative etc. This is because of Capital Market players like AFEX Commodities Exchange bridging the gap between Finance and farmers, using innovation and blended finance (through alternative assets).

In 2020, AFEX Commodities Exchange was able to raise about N3.1 billion to finance the various stages in the value chain of the food system in Nigeria.

To boost credit extension to the real sector like Agriculture, the CBN increased banks' loans to deposit ratio to 65 percent in Q3 2019. To date, credit to the Agriculture sector as grown averagely by 10 percent quarterly to N903.7 billion as at Q2 2020 from N673.1 billion in Q3 2019.

The increased participation of private companies in the quest to increase productivity in the agriculture space amid the clamour for economic diversification is largely commendable. This will complement several intervention programs undertaken by the federal government to boost productivity.



Source: AFEX Survey

C. GOVERNMENT POLICIES

The protectionist policy from the fiscal authority extended into 2020 after the closure of the land borders in August 2019. This is in a bid to boost local production in preparation of the AfCFTA while fighting smuggling activities in and out of the country. Beyond the impact on inflation, the policy has boosted agricultural productivity and spur investments in commodities such as rice production. This has been fuelled by the shift in households' consumption preferences from foreign brands of rice to locally produced varieties.

As a result, the Thai Rice Exporters Association revealed that Nigeria imported metric tons of rice in half-year 2020 slumped by more than half (57.36 percent) to 1,192 metric tons from corresponding period of 2019.

Possible Policy Intervention Areas and **Recommendations**

Lack of access to loans and fertilizers remained largely the biggest challenge to most farmers in 2020.

The high interest rate environment in the country, coupled with the risk involved in agro financing – as change in yield and other challenges could impede the capacity of farmers to pay back loans – remain major impediments to loan access and disbursement over the years. This explains the low exposure of banks to the agriculture space despite policy makers objective to enhance food security in the country. According to the National Bureau of Statistics data, credit to the Agriculture sector in Q2 2020 accounted for a meagre 5 percent.

Fertilizer on the other hand remains a core agriculture input which affects negatively or positively crop yield dependent on the usage per hectare. At about 20kg fertilizer usage per hectare on the average, Nigeria lags Sub-Saharan peers like South Africa and Egypt that use over 100kg/ha and other developed economies that use above 200kg/ha. This is despite measures to enhance the procurement and distribution of fertilizers to farmers during the farming season. While farmers according to the survey employed the use of fertilizers, inadequacy was a major factor they complained.

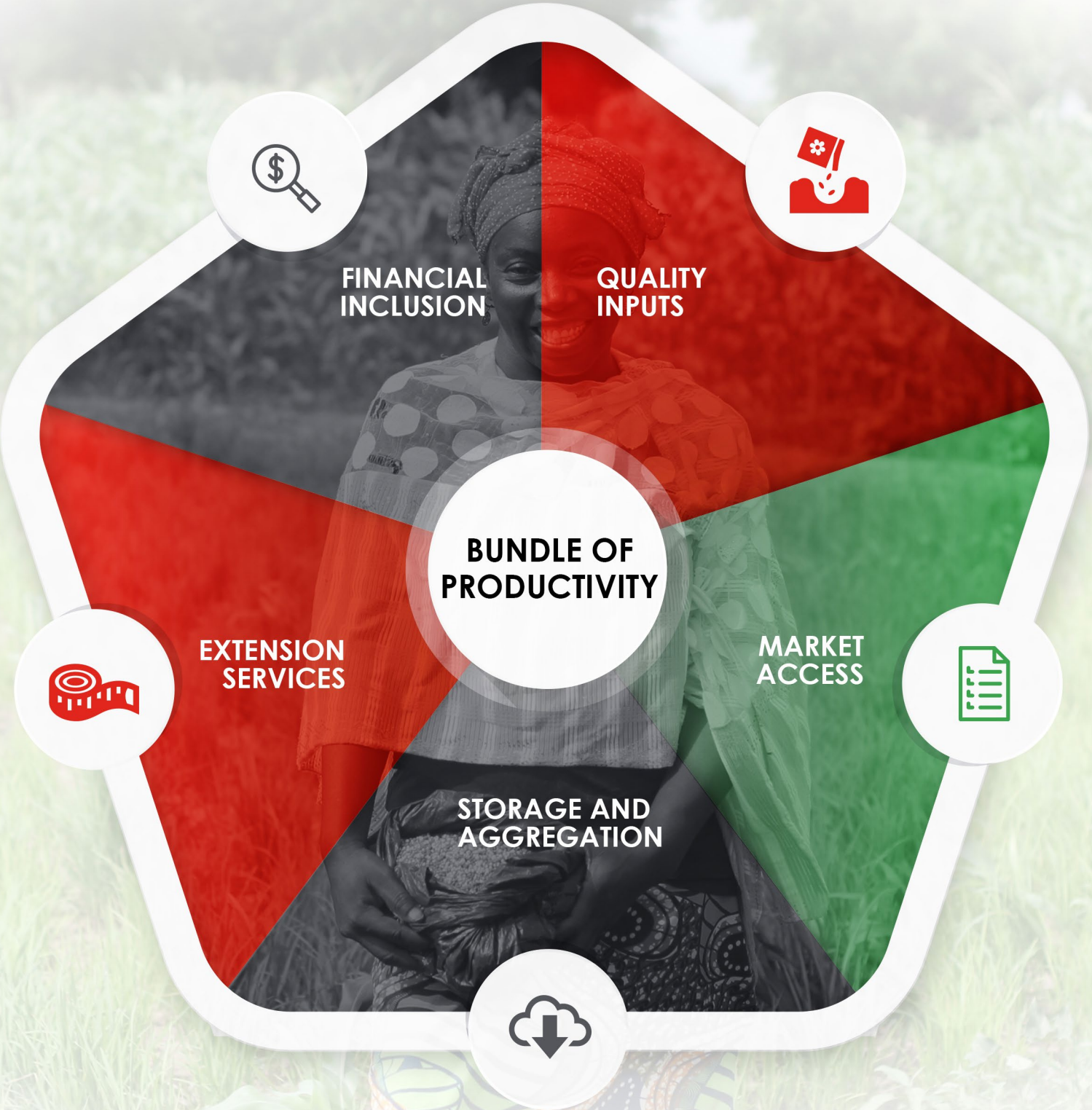
A report by (NAERLS) buttresses that during the 2020 wet season, about 27 States reported procuring and distributing seeds and seedlings, agrochemicals, fertilizers, and farm equipment to farmers. However, the inputs were found to be inadequate and largely unaffordable to some farmers. The major seeds and seedlings procured and distributed were maize, rice, sorghum, soybean, millet, sesame, cowpea, cassava cuttings, pepper, oil palm, plantain, and banana.

Most of the farm inputs procured and distributed were reported to be affordable to farmers except in some States like Katsina, Anambra and Akwa Ibom that reported that seeds and seedlings procured and distributed were not affordable to farmers. Agrochemicals were also reported not affordable in Kwara, Nasarawa, Katsina, and Akwa Ibom. The inadequacies of farm inputs in these states could be attributed to the COVID -19 pandemic lockdown. Most of the farm inputs procured were likely procured and distributed before the pandemic lockdown. The inadequacies of farm inputs to farmers affects crop situations on the field.

As part of our recommendations, boosting access to loans at lower cost to smallholder farmers is key to boosting production. Although policies geared towards achieving this are in place, however proper policy design, monitoring mechanism and adequate and robust regulatory framework that supervises the implementation and operation of the programme are also important.
Also, Nigeria has a great potential for increasing productivity and production through the increased use of agricultural inputs like fertilizer. However, input prices remain high weighing largely on demand by smallholder farmers. Beyond current fertilizer subsidies, we suggest more interventions and reforms aimed at eliminating bottlenecks in the fertilizer supply chain which as impaired the confidence private investors over the years. There is need for a conducive policy environment and strengthened institutional and regulatory environment.

Also, improvement of port infrastructure and product-handling efficiencies will lower overall costs of input imports and improve competitive advantage of exports.

AFEX



AFEX's Bundle of Productivity turns Inputs to Impact

Appendix

SURVEY METHODOLOGY

The Crop Production Survey covered all geopolitical zones in Nigeria but with more emphasis on key grains producing regions based on the historical data on the volume of production from each region in Nigeria as relating to the crops covered by this report. Structured questionnaires, an online checklist and key informant interviews were used in the data collection.

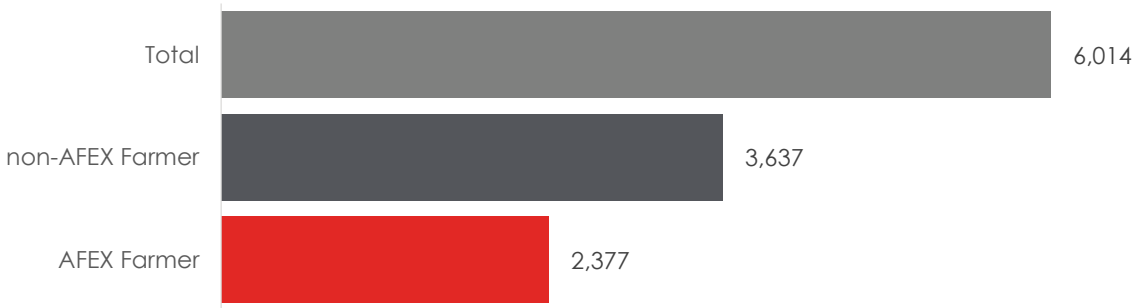
As dictated by AFEX Crop Production Methodology, primary data was used, as questionnaires were filled by enumerators on behalf of the farmers. Due to the challenges of COVID-19 in the country, on field visits of the farmers in their different location was not advisable as AFEX tried to curb the exposure of the enumerators and the farmers during the survey. Hence, an innovative means of phone calls in order the reach the farmers was used in the primary data collection.

Sample Characteristics

a. Number of Respondents

The study set out to survey 10,000 farmers from all regions of the country comprising of AFEX farmers and non-AFEX farmers. However, the study got 6,014 farmers – representing 60 percent – respond to research questions provided. Out of which, 60.48 percent were non-AFEX farmers and 39.52 percent were AFEX farmers, respectively.

Survey respondents in total and as part of the AFEX network

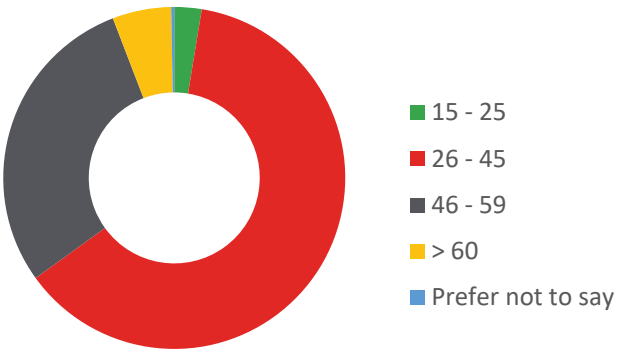


Source: AFEX Survey

b. Age

Responses were gotten from farmers across 4 age brackets: 15-25, 26-45, 46-59, and above 60. About 62.5 percent of the sample collected are young adults (i.e., within the age bracket 26-45years), 29.1 percent (46-59years) and 5.6 percent (>60 years). Female farmers accounted for 9.39 percent (565) of total farmers captured in the study while the Male farmers 5,449, respectively.

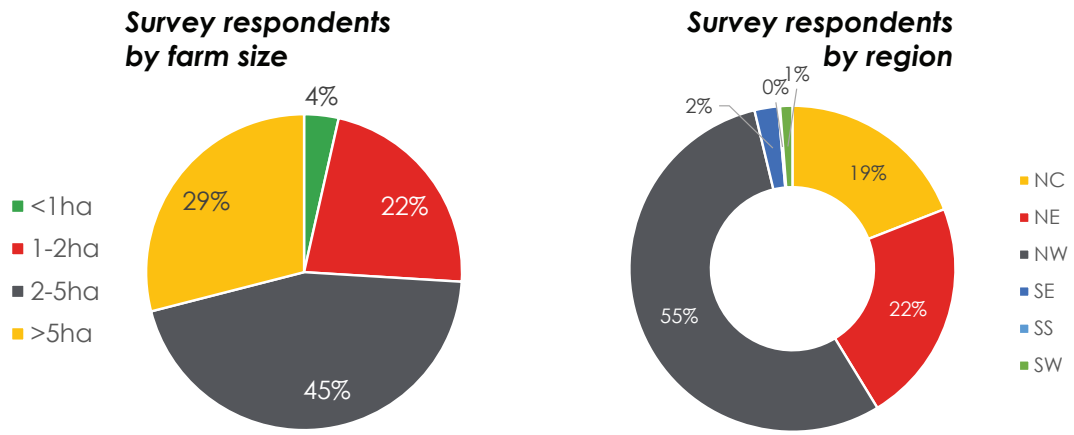
Farmers by age bracket



Source: AFEX Survey

c. Demography

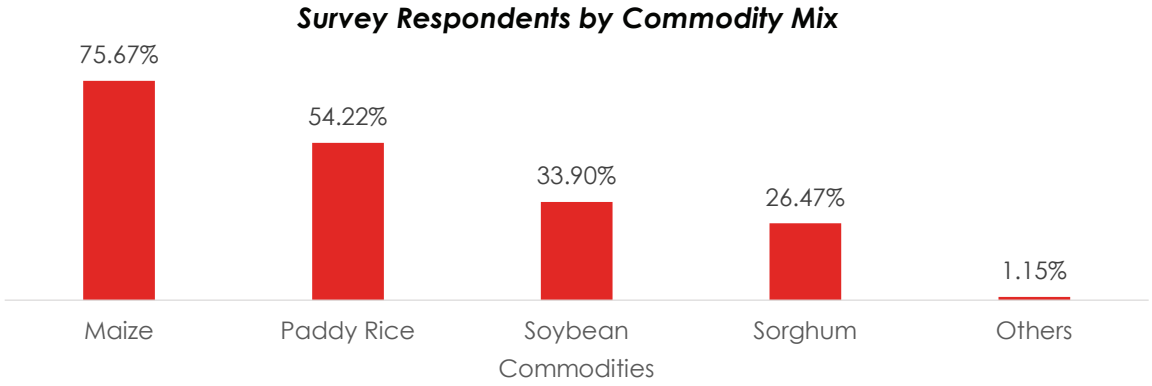
The survey captured farmers from North East, North West, North Central, South East, South South and South West. The survey established that 45 percent of total farmers cultivated between 2-5 hectares of land in 2020 against 29 percent who cultivated above 5 hectares during the period under review. 22 percent of farmers cultivated between 1-2 hectares and 4 percent cultivated less than 1 hectare.



Source: AFEX Survey

Our analysis revealed that farmers in the South West Region used more than 5 hectares of land compared to other regions. The Northern region however, cultivated between 2-5 hectares during the period reviewed while the South South and South East region.

Across 5 major crops surveyed, we established that all farmers cultivated at least 2 crops. About 75.6 percent of total farmers having maize in their mix to represent the most cultivated crop during the period under review. Paddy rice followed closely with 54.20 percent.



Source: AFEX Survey

d. Farming by Experience

It is a given that the level of experience in any endeavour to some extent has an effect the level of productivity of a said professional. In the Survey the data on the level of experience was collated as there was an underlying hypothesis of a relationship between the level of experience and the correlation of farmers expectations to the actual volume of production.

From the data, it was observed that about 80 percent of the famers interviewed had between 11-15 years of experience, with most farmers in the North having between 11-15 years of experience while most farmers in the Southern parts of Nigeria have above 15 years of experience.

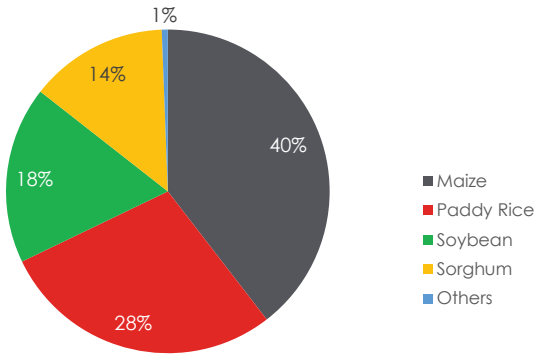
Distribution by Farming Experience

Source: AFEX Survey

e. Crop Produced

The distribution of the sample based on the crop produced, showed Maize to be the most produced crop in the sample, this is maybe because of the nature of the crop in Nigeria. Being a staple food item, Maize is important to the regular household in Nigeria, a large proportion of the crop produced is used for feeds and industrial uses while a smaller proportion is consumed directly.

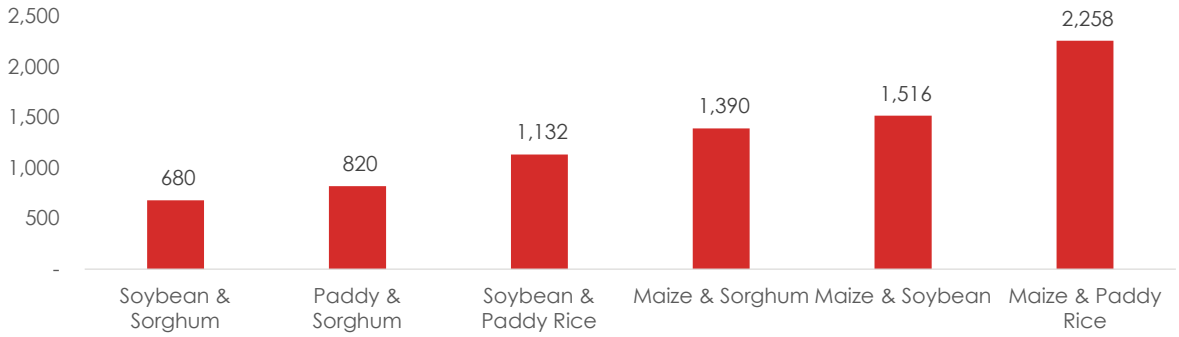
Distribution of Farmers by Crops



Source: AFEX Survey

In this survey, it was observed that most farmers engaged in diversified farming with farmers cultivating two or more crops on their land. About 38 percent of the respondents cultivated a combination of Maize and Paddy Rice.

Distribution of Diversified Farms by Crops



Source: AFEX Survey