Direct Research Journal of Agriculture and Food Science
Vol. 10(5), Pp. 144-150, May 2022
ISSN 2354-4147
DOI: https://doi.org/10.26765/DRJAFS013726489
Article Number: DRJAFS013726489

https://directresearchpublisher.org/drjafs/

Review paper

Rising Costs of Farm Inputs and its Implication on 2022 Wet Season Farming in Northwest sub region of Nigeria

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Received 7 April 2022; Accepted 12 May 2022; Published 28 May 2022

ABSTRACT: This paper examined the effects of agro-input price increases on wet season farming in 2022. The effects were observed in terms of short-run, medium-run, and long-run effects, as well as uncertainty considerations. The article also examined the influence of agro input price increases on household food security, as well as the impact of agro input price changes on farm families'/rural households' economic activities. Factors contributing to growing farm input costs include rising commodity prices, excessive demand for inputs, widespread supply shortages, transportation bottlenecks, and so on. The article examined historical trends in general farm input price increases. Finally, the report discussed solutions for lowering farm input costs and examined the 2022 farming season like no other in terms of excessive pricing of agro inputs and related commodities, as well as the implications for the approaching wet season farming in Northwest Nigeria.

Keywords: Rising costs, farm inputs, implication, 2022 wet season farming, Northwest sub region, Nigeria

INTRODUCTION

Rising fertilizer, agrochemical, and better seed prices are projected to cost farmers even more during the upcoming wet season. Weeds and pests are a key source of concern for farmers at all levels. The majority of farmers rely on chemical fertilizers, herbicides, and insecticides for crop development because hiring laborers for weeding is prohibitively expensive.

Chemical fertilizers, herbicides (both selective and non-selective), and insecticides have all increased by more than 100% in most farming communities across the country. Foliar systemic herbicides such as Lagon, Forceup, Touchdown, Paraforce, Gobara Dragon, and Sriker have all increased in price.

The price for one litre is now between N3,000 and N7,000 in most markets across the country. Last year, these products were sold between N1,200 and N2,000 (Ashby, 2019). Farmers need at least 4-6 litres per hectare, depending on the brand and quality of the herbicide. In the wet season where farmers do not have control over elements of production such a draught, flood and rain, effectiveness of the chemicals is affected.

Agro-input prices have more than tripled in recent years. When compared to previous growing seasons, the prices of main farm inputs such as fertilizers, pesticides, and seeds have tripled. Land preparation has also increased in price from N5,000 to between N12,000 and N15,000 per hectare.

The cost of cultivating farmlands has gone out of control, and this is likely to affect the prices of the items that will be planted this season. Farmers within the North West sub region, have decried the high cost of farm inputs especially, fertilizer and other agrochemicals

needed for successful farming. There is a recognition that the use of improved inputs improves food production for local and export purposes. In Nigeria, a large chunk of farmers operates on small-scale basis under challenges associated with socio-economic, cultural and institutional conditions (Dianna and Mendoza, 2018).

Nigeria's food inflation rate is expected to intensify in the next months, since the country is now witnessing a wave of high food costs as a result of the recent increase in fertilizer prices (Jayanthi et al. 2012).

According to Mamun et al. (2021), Nigeria's smallholder farmers are currently dealing with rising fertilizer costs as a major input for crop production, with the average price of a 50kg bag of NPK 15:15:15, the most commonly used type by smallholder farmers, now selling for N25,000, up from N7,500 the previous season. This is a price increase of 113 percentage points. Similarly, the average price of a 50kg NPK 20:10:10 varies between N25,000 and N23,000, up from N13,000 in the early part of the year, indicating a significant increase in price. Urea now sells for N15, 000, up from N11, 000 earlier this year, signifying an 83 percent rise in price. Agrochemical prices have risen, making the situation difficult for farmers, who are likely to postpone planting during this year's wet season.

The purpose of this article is to start a conversation about the impact of rising input prices on households. Price increases in agro-input items form a covariate shock, the effects of which will influence all elements of livelihoods if they persist over time. In the short run, the impact will be negative for net food buyers as soon as they are transmitted locally. Substituting with less expensive farming methods is likely to minimize the magnitude of the negative consequences. More negative implications will emerge gradually as the manufacturing structure shifts. Agricultural development is one of the most important strategies for ending extreme poverty, increasing shared prosperity, and feeding the 9.7 billion people expected by 2050. Growth in agriculture is two to four times more effective than growth in other industries in improving incomes among the poorest. According to 2016 data, agriculture provided a living for 65 percent of poor working individuals. Agriculture is extremely important for economic growth, accounting for one-third of global GDP in 2014 (Nawaran et al., 2009). Agriculture is the study or practice of farming, which includes the cultivation of soil for crop growth and the keeping of animals to supply food, wool, and other products, whereas agricultural productivity is a rise in agricultural produce output per capita (Stamp 1970). To fulfill the needs of a world population that is estimated to exceed nine billion by 2050, agricultural production must expand by at least 60% (Lightfoot and Minnick 2014). Because of its relative relevance and potential rewards. To meet food demand, agriculture would need to generate over 50% more food, feed, and biofuel in 2050 than it did in 2012. Food and Agriculture Organization estimate takes into account recent United Nations (UN) projections indicating that the world's population would reach 9.73 billion in 2050. In sub-Saharan Africa and South Asia, agricultural output would need to more than double by 2050 to meet increased demand, while in the rest of the world the projected increase would be about one-third above current levels (Ashby, 2019).

Impacts of agro-inputs price hikes on 2022 wet season farming

According to report by Jayanthi *et al.* (2012) some stylized facts that indicate the short run and long run effects of agro-input price hike.

Short run effects

The implications of rising agro input prices on wet season farming in 2022 might be classified as immediate, medium, or long-term. The immediate impact on the consumption side is projected to be negative, and this consequence will primarily harm poorer households that spend the majority of their consumption expenditures on food.

Lightfoot and Minnick (2014) establish a framework for estimating production elasticity as a result of changes in agricultural input prices. The elasticity is further subdivided into its direct component, which measures the effect on poverty when all farm input prices change in the same direction and quantity, and its substitution component, which considers the relative position of each of the major farm inputs in the distribution of production processes. If this later element is highly negative, the overall effect on poverty may also be negative.

While the methodology is quite informative and simple to implement, it does not account for the second round impacts in the production structure caused by price changes, even though such effects are partially mediated by substitution among food items in consumption. Farmers' production mix adjustments, in particular, are difficult to balance with the consequences of price rises on their consumption attitudes.

Medium or long run effects

On the basis of each country's relative comparative advantage in economic sectors, certain basic channels through which secondary impacts are projected to affect livelihoods can be traced. Price increases in agro-inputs, in particular, are dynamics that may result in the expansion of food-producing sectors if the country has a comparative advantage in these sectors. In developing

countries these sectors are located mainly in rural areas and consist usually of large numbers of small landholders or land renters. Food production in underdeveloped nations is typically labor intensive, relying mostly on unskilled labor and the use of agro-inputs to boost output. As long as input prices are successfully conveyed at the farm, the expanding sector is projected to boost its demand for labor, and hence agricultural wage workers are likely to benefit. This result is especially significant given that poverty analysis usually identifies the poorest as landless, irregular wage earners in agriculture. Increases in the price of the fixed factor may also be considered in places where land constraints are binding.

Uncertainty considerations

Lastly, particular attention is necessary to be addressed in the issue of the underlying risk in this year's farming season that price increases in agro-inputs are expected to influence. Research in developing countries, argued and provided empirical evidence that especially in rural areas, risk and volatility in the income of farmers to address increasing demands of agro inputs, is not only quite extensive but usually remains uninsured (Dianna and Mendazo 2018).

Furthermore, data suggests that income shocks and uncertainty are severe enough to affect consumption, resulting in insufficient levels of food crop production (Ashby, 2019). In recent research, the relevance of livelihood stability has been identified as a critical feature that characterizes the middle income groups of developing countries.

The rural poor's inability to cope with income shocks in order to afford agro inputs is mostly due to their limited asset base (land, livestock, physical and human capital), which leaves little room for efficient self-insurance. Poor rural farmers are opting for low-risk income-generating ideas and approaches in order to purchase agricultural inputs for the upcoming farming season in 2022. Input price increases are covariate shocks that affect the wellbeing of the entire population of emerging countries. Even while they benefit major areas of the developing world, they are likely to increase the unpredictability of revenue sources.

The Impact of increase in the prices of agro-inputs on Household Food Security

Mamun et al. (2021) argue in a portion of his paper that household income strategies for purchasing essential agro inputs. The relative importance and diversification of income sources in the household portfolio are predicted to characterize the groupings of families that would be affected by rising agro input prices. The assumption is that, based on expenditure quintiles, the major contributor sources of earnings will determine how significant the welfare effect of rising agriculture input prices will be. Given that agricultural households face implications from both the incomes and production sides, extra emphasis is paid to their livelihood activities.

The impact of agro-inputs price changes on economic activities of rural households

The influence of variations in agro input prices caused by swings in market prices and by marketers has a massive impact on agricultural productivity. Rising input costs raise production expenses. The input price simulations included two scenarios: (1) an increase in the price of seed, SP-36 fertilizer, urea, and so on. The policy of increasing input prices has an impact on the economic activities of farming households, including input usage, labor providing, and income sourcing. The increase in input prices reduced the amount of manure generated by 4.32 percent. Farmers continued to treat manure as usual due to their limited reliance on foreign inputs. The increase in input prices had little effect on manure production (Nawaran et al., 2009).
(1) Labour shortage to process the cow crap into manure, (2) difficulty in transporting manure rice fields, and (3) the availability of chemical fertilizers is not easy to obtain.

The use of inputs for crop production has decreased due to the increase in their prices. Increased input prices such as urea fertilizers, NPK, improved seeds and agro chemicals have greater impact on improved agricultural productivity and livelihood activities of the rural poor farmers.

Factors contributing to rising farm input cost

Mamun *et al.* (2021) opined that throughout 2020 and 2021, various economic events have contributed to the rise in input farm expenses. Some contributing factors include:

Increasing commodity prices

Although increases in commodity prices benefit the producers that grow them, they can have differing effects for producers who utilize these commodities, such as seeds.

Widespread supply chain shortages of inputs

From shortages in farm equipment to shortages in fertilizer and pesticides, constraints on the supply

Table 1. Historical Annual Rates of Change for General Inflation and Farm Input Prices

	Annual Percentage Changes		
	21	17 to 21	12 to 21
Implicit Price Deflator for Personal Consumption Expenditures	3.9%	2.1%	1.6%
Agricultural Production Items	6.8%	1.7%	1.2%
Feed	13.1%	2.6%	1.2%
Seed	-0.3%	-1.4%	1.3%
Anhydrous Ammonia	69.4%	11.7%	2.3%
Diammonium Phosphate (18-46-0)	65.4%	12.1%	2.0%
Potash	56.7%	12.9%	0.9%
Agricultural Chemicals	2.0%	-1.5%	0.0%
Diesel	46.9%	10.2%	-0.2%
Supplies and Repairs	7.2%	3.4%	2.2%
Machinery	7.1%	2.7%	2.8%
Building Materials	16.3%	5.6%	3.5%
Wages	6.9%	4.8%	4.0%

Source: American Bureau of Statistics (2022)

chain is pushing farm expenses up.

Strategies to reduce farm input costs

Transportation bottlenecks

Various bottlenecks in transportation this year, including trucking shortages and port closures, have led to increases in input prices that translate to higher production expenses.

Prices of other commodities

An increase in price of other commodities will induce an increase in the prices of agro-inputs.

Prices of related inputs

For purposes of supply analysis, related goods refer to goods from which inputs are derived to be used in the production of food and commercial crops.

Conditions of production

The most significant factor here is the state of technology. If there is a technological advancement related to the production of the input goods, the supply increases.

Expectations

Sellers' expectations concerning future market conditions on agro inputs can directly affect farm output.

Price of inputs

If the price of inputs increases the supply curve will shift left as sellers are less willing or able to sell goods at any given price. Inputs include fertilizers, chemicals, seeds etc.

Number of suppliers of inputs

As more firms enter the industry of producing agro inputs the market supply curve will shift out driving down prices. The market supply curve is the horizontal summation of the individual supply curves for the agro inputs.

Government policies and regulations on inputs

Government intervention can take many forms including environmental and health regulations, hour and wage laws, taxes, zoning and land use regulations. These regulations can affect input good's supply.

Historical trends in general farm input prices hikes

Dianna and Mendoza (2018) examined the 1-year, 5-year, and 10-year averages of the implicit price deflator for personal consumption expenditures and farm input costs. Except for fertilizer, data for other farm inputs are available. Table 1 shows the average price changes for inflation and agriculture inputs from 2012 to 2021, from 2017 to 2021, and from 2022. The first thing that stands out is how much higher inflation was in 2021 compared to the 5- and 10-year norms. Input inflation averaged 1.6 percent over a ten-year period.

Dianna and Mendoza (2018) compared the rate of general inflation to annual changes in farm input prices. The annual rise in the implicit price deflator for personal consumption expenditures was greater than the annual change in the input price deflator for all farm inputs except seed and agricultural chemicals. The annual price fluctuations for electricity and fertilizer were especially significant.

Diesel's annual price change was 47 percent. Annual fertilizer price variations ranged from 57 percent for potash to 70 percent for anhydrous ammonia. Looking at 10-year averages, the only farm inputs with price changes greater than the implicit price deflator were anhydrous ammonia, ammonium phosphate, supplies and repairs, machinery, building materials, and salaries. Except for the 10-year average price adjustments for building materials (3.5%) and wages (4.0%), none of the 10-year average price changes topped 3%. The results demonstrated how far the price changes in 2021 were from the long-run norms.

Ashby (2019) in his study lamented that, while rising input costs certainly pose a significant challenge for farmers, there are ways to mitigate their negative effects.

Pay attention to key performance indicators

Before deciding how to cut production costs, it is critical to discover and comprehend crucial data points that quantify aspects affecting your operations. It is crucial to note, however, that they vary depending on the operation. You can better understand when and where you need to cut farm production costs by paying attention to quantitative assessments of your operations. Monitoring these parameters so adds to both higher yields and lower total expenses.

Be strategic with your seed and chemical purchases

Before purchasing seed, pesticides, herbicides, and fertilizers, it's crucial to conduct research and compare costs and quality between suppliers. Instead of simply choosing the cheapest option, it's important to investigate online reviews or seek input from the agricultural community to ensure that the quality of the product still meets your needs.

Place orders early

Placing orders for these products early and negotiating with suppliers in advance can help secure a good price amidst market volatility.

Consider generic products

Generic products can be good alternatives that help you save on unnecessary costs.

Implement

Utilizing these methods to manage pests is a good way to limit fertilizer costs.

Invest in precision agriculture technology

Precision agricultural technology is essentially a means for producing more with less. Precision agricultural technology adds to cost savings by assisting you in optimizing input purchases. Farmers that employ precision agricultural technology have raised maize yields by 11% while decreasing operational costs by 9%.

Examples of cost-saving precision ag technology

GPS, Variable rate application technology, Drip irrigation systems, Smart cloud databases AI technology.

Consider transitioning from leasing to owning farmland

Renting or leasing farms incurs additional charges that

raise your total production costs. According to the USDA, the average rent for cropland in 2020 was $139 per acre, rising to $141 per acre in 2021. Furthermore, agricultural cash rents differ by state, with California, Arizona, and Hawaii having the highest cash rents. Buying farmland can be a viable alternative to renting because it not only removes rent payments but also provides you with a steady investment that grows over time. Furthermore, ownership gives you more control over how you use your land.

Land ownership

A Mississippi pecan grower who had been farming the same land for years decided to purchase the land he was renting and begin his journey of land ownership.

Restructure debt to increase working capital

Traditional lenders frequently may not comprehend the specific and diverse needs of farm operations. As a result, these loans do not provide farmers with financial security. Fortunately, restructuring farm debt with a lender that understands your operation's specific demands can fix a fragile financial foundation. You can raise your working capital by consolidating existing debt into a new loan with lower payments, allowing you to invest in operational renovations and improvements.

Monitor key performance indicators

It is critical to thoroughly monitor operational performance and take key performance indicators into account (KPIs). Measuring these indicators helps to reduce farm input costs by giving quantitative metrics that identify financial strengths and areas for improvement in the agricultural industry. Keeping monitoring of KPIs so adds to higher yields and cheaper input costs. Commodity pricing, working capital, debt-to-asset ratio, asset turnover ratio, and regional price of products are the top five KPIs to monitor.

Smart investing in cost-saving methods

Another strategy to cut farming operations costs is to invest in precise agriculture technologies and efficient farm equipment. Smart investing decisions can save costs while increasing yields over time. As a result, the operation becomes more resistant to change. In reality, farmers who employ precision agricultural technology have raised maize yields by 11% while decreasing operational costs by 9%.

Develop a vertically integrated farming operational plan

Vertical integration is a tremendously powerful strategy that allows farmers to control the production aspects on their farms. This allows them to cut their operational costs. Many cow ranchers, for example, cultivate their own feed in order to get wholesale pricing. This also opens up the possibility of additional cash sources if they start supplying feed to others.

Vertically integrated farm increases working capital with flexible Financing

To mitigate risk and increase profit margins, a multigenerational farm operation in New Mexico developed into a vertically integrated operation. This means that they planted, harvested, and packaged their goods shipped nationwide. As a result of surging farm input costs, farmers are having to spend a larger share of their working capital on production costs. Therefore, when more working capital goes towards production expenses, less can be utilized for expansion and investing in the growth and evolution of your operation.

2022 – A season like no other

According to Mamun et al. (2021), farmers will encounter supply chain issues like never before in the 2022 growing season. That's why it's wreaking havoc on their finances like never before. To begin with, there is growing global demand for crop planting. According to the March World Agricultural Supply and Demand Estimates, the worldwide outlook for commodities production is improving.

The current Russian military intervention in Ukraine has raised the volatility of agricultural supply and demand situations in the region and beyond. With these recent occurrences, there is additional pressure on all other commodity-producing countries to provide all, if not more, of the planned production in 2022 in order to compensate for any potential production lost and cut off from the market in Ukraine and Russia.

Crop inputs such as fertilizer, seed, herbicides, and machinery, to name a few, are in more demand as the number of planted acres grows. Not only is demand for these supplies increasing, but COVID-19-related government deficit spending and loose monetary policy by central banks around the world have placed more money into circulation, contributing to increased worldwide inflation of agricultural inputs. As a result, everything, including in-demand crop inputs, will cost a little more. According to Mamun et al. (2021), practically all production costs have increase d for farmers since

2013. Most significantly, farm-based expenses for cattle and poultry have climbed by 46 percent, while marketing, storage, and transportation costs have increased by 59 percent. Overall, the intermediate expense category has climbed 18 percent since 2013, which covers the majority of farm production inputs.

Conclusion

The overall inflation of farm input prices was examined in this article. Farm input prices are substantially connected with general inflation over lengthy periods of time. Farm input prices, on the other hand, are not perfectly associated with overall inflation. The supply and demand fundamentals for each input are different. Fertilizer, seed, and chemical price indices are more closely linked to general inflation than feed, machinery, land, and biofuels. Only Agrochemicals and Fertilizers had a rate of change in terms of general inflation during the last 12 months among the input prices evaluated. Agricultural production items, a broad gauge of farm input prices, rose 15.6 percent, more than double the overall rate of inflation. Chemicals, seeds, and fertilizer goods saw particularly high price changes in the recent 12 months.

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