



FACTORS MILITATING AGAINST AGRICULTURAL PRODUCTIVITY OF CROP FARMERS IN NIGER STATE, NIGERIA

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ABSTRACT

Niger State has the largest landmass in Nigeria. With 8.6 million hectares of land which represents about 9.3% of the total landmass of Nigeria, the state experiences distinct dry and wet seasons with annual rainfall varying from 1,100 mm (120 days) in the northern part to 1,600 mm (150 days) in the southern part. The vegetation, soil and weather patterns are favourable to produce a wide spectrum of food and cash crops of various types. The major crops grown in the State include rice, maize, millet, sorghum, yam, potato, soybean, groundnut, cashew, benniseed and cassava. The primary aim of this study was to investigate the factors militating against agricultural productivity of farmers in production of crops in the state. Both primary and secondary data were used for the study purposes. Descriptive statistics was used on sample of 360 crop farmers. Findings from the study indicates that fertiliser, herbicides, labour, late onset rains and high interest rates are the factors militating against the production of food crops in Niger State. The study thus concluded that, the application of inappropriate agronomic practices such as untimely planting, incorrect plant spacing, wrong method of planting, poor sowing depth, delayed weeding, ineffective pest and disease control, inappropriate use of fertilizers, untimely harvesting, use of low yielding varieties and inconsistent rainfall patterns, will always significantly reduce crop yields.

Keywords: Productivity, Agriculture, Crop production, Borrower, Crop farmers.

INTRODUCTION

Agricultural productivity is measured as the ratio of agricultural outputs to inputs (Dharmasiri, 2013). While individual products are usually measured by weight, which is known as crop yield, varying products make measuring overall agricultural output difficult. Agricultural productivity may also be measured by what is termed total factor productivity (TFP). This method of calculating agricultural productivity compares an index of agricultural inputs to an index of outputs. This measure of agricultural productivity was established to remedy the shortcomings of the partial measures of productivity; notably that it is often hard to identify the factors cause them to change. Agricultural productivity is an important component of food security (Mbow *et al.*, 2019).

Agriculture in Nigeria employed about 70% of her population according to Nlebem (2018), before the discovery of oil and its subsequent boom, agriculture was the main source of foreign exchange in the country however oil boom reduced this role. Invariably, over 70 percent of Nigerians engage in the agriculture sector mainly at a subsistence level. An essential feature of agricultural production scene in Nigeria is that small farm with land holdings of less than 2.0 hectares per farmer collectively produce over ninety percent of the total agricultural production in the country (Aturamu and Daramola, 2005). Also, majority of these farmers still produce at subsistence level using old management practices that are not economically viable with an overall effect of low productivity and technically inefficient production process (Ogunsumi, 2005).



Nigeria has 70.8 million hectares of agriculture land area with maize, cassava, guinea corn, yam beans, millet and rice being the major crops. Nigeria's rice production rose from 3.7 million metric tons in 2017 to 4.0 million metric tons in 2018. In spite of this, only 57% of the 6.7 million metric tons of rice consumed in Nigeria annually is locally produced leading to a deficit of about 3 million metric tons, which is either imported or smuggled into the country illegally. To stimulate local production, the Government banned importation of rice in 2019.

In order to promote agricultural productivity, the Government has implemented several initiatives and programmes, this includes the Agriculture Promotion Policy (APP), Nigeria–Africa Trade and Investment Promotion Programme, Presidential Economic Diversification Initiative, Economic and Export Promotion Incentives and the Zero Reject Initiative, Reducing Emission from Deforestation and Forest Degradation (REDD+); Nigeria Erosion and Watershed Management Project (NEWMAP); Action Against Desertification (AAD) Programme, among others (Food and Agriculture Organization [FAO], 2022).

All these efforts aimed to increase agricultural productivity in order to provide enough food to meet domestic demand as well as an abundance of commodity crops for export in the international market. Besides, they aim at reversing forest loss and degradation; promoting sustainable management of natural resources; rehabilitation of degraded lands and reducing erosion and climate vulnerability (FAO, 2022).

Despite the contribution to the economy, Nigeria's agricultural sector faces many challenges which impact on its productivity. These include poor land tenure system, low level of irrigation farming, climate change and land degradation. Others are low technology, high production cost and poor distribution of inputs, limited financing, high post-harvest losses and poor access to markets (FAO, 2022).

The livelihood of a major proportion of population in the developing world is directly or indirectly connected with agriculture. World Bank reports that 2.5 billion people depend on agriculture as their main sources of livelihood and among them 1.3 billion people are small farmers and landless workers. Agricultural development is one of the most powerful tools to end extreme poverty boost shared prosperity and feed a projected 9.7 billion people by 2050 (World Bank, 2022). Invariably, agriculture can help reduce poverty raise incomes and improve food security for 80% of the world's poor, who live in rural area and work mainly in farming (World Bank, 2022). Increased agricultural productivity is of great importance for all these people. An increase in a region's agricultural productivity implies a more efficient distribution of scarce resources. Over the past years, Nigeria has dealt with very low yields per hectare due to shortages in the supply of inputs such as seedlings and fertilisers as well as inadequate irrigation and harvesting systems, which hinders productivity and yield rates (Olayiran, 2020).

Weather forecasting and crop yield prediction or simulations are relevant tools that provide a warning to farmers in preparation of the upcoming season. From the simulation results, farmers can change the crop planting date, use appropriate genotypes, adjust the fertilization and the irrigation cycles to obtain reasonable yields, thus reducing the risk of unexpected events (Tandzi and Mutengwa, 2019). The knowledge of appropriate planting methods is important because climate events influence the selection of planting method and thus yield even though the total planted area remains unchanged (Lizumi and Ramankutty, 2014). In the same vein, it has been reported that any programs that are working to minimize the adverse impact of climate change on food crops production should first consider the type of crop grown, the production area as well as the geographical and climatic conditions (Poudel and Shaw, 2016).



Despite the challenges and recent setbacks in global agricultural productivity rates, the future horizon is optimistic for farm efficiency improvements and their potential impact on economic development. This is especially true in developing nations that have significant potential to improve their current productivity rates by intensifying their agricultural lands (AGRIVI, 2022).

In the same vein the study is set to investigate the factors militating against productivity of crop in the study area. Thus, the objectives of the study are to determine factors militating against agricultural productivity, identify the problems faced by crop farmers in food production and to determine the degree to which these problems have affected productivity in Niger State.

MATERIALS AND METHODS

The Study Area

The area of study was Niger State. It is located between latitudes 8° 11' N and 11° 20' N and longitudes 4° 30' E and 7° 20' E. The State covers an estimated land area of 86,000 square kilometres, representing about 9.3% of the total land area of the country (Alhassan, 2012). According to the 2006 census, the State has a population of 3,950,249 people which is projected to be increasing at an annual population growth rate of 2.38%. The vegetation, soil and weather patterns are favourable to produce a wide spectrum of food and cash crops of various types. The major crops grown in the State include rice, maize, millet, sorghum, yam, potato, soybean, groundnut, cashew, benniseed and cassava. The amount of rainfall is between 1100mm – 1600mm per annum with average monthly temperature ranges from 23°C to 37°C.

Sampling Procedure

A two-stage sampling technique was used. A list of crop farmers obtaining loans from microfinance institutions was obtained from the board of microfinance institutions from the state. This provided the population frame from the borrower farmers. Ten percent (10%) of the borrowing farmers from each of the seventeen local government was estimated and randomly selected. This gave a sample size of 190 borrowing farmers. A purposive sampling technique (homogeneous sampling) was used in selecting a total of 10 food crop farmers (those cultivating rice, maize, yams and other crop for both subsistence and commercial purpose from each local government). Furthermore, a total of 360 crop farmers were used for the study, this formed the sample size.

Method of Data Collection

Primary data was used for the study. The primary data was collected through administration of structured questionnaire. The data collected includes demographic information, such as age, educational level, and farm size, amount of credit, crops grown, labour, fertiliser, and years of experience in farming. Production information was also collected; this includes output and inputs such as seed, fertilizer, pesticide, herbicides, and labour used.

RESULTS AND DISCUSSION

Several factors have been identified in the social science literature as the most important sources of productivity change in agriculture: research and development, extension, education, infrastructure, and government programs. Productivity measures do not provide any information about the separate role of each of these factors. However, an understanding of the potential sources of productivity growth is important for formulating appropriate policy tools to increase productivity. The following factors were identified as the major constraints impeding productivity of crops in the study area.



Fertilizer/Herbicide

The scarcity and high cost of fertilizer in the study area was a major concern to the farmers. This was ascertained by almost half of the sampled farmers. Abutu (2014) noted that initially, the government was subsidizing organic Fertilizer to help boost agriculture in Nigeria. During this period, most farmers get access to fertilizers at affordable prices. Today, most government at various levels placed low premium to subsidizing of organic fertilizer thereby making the commodity to be too expensive for the poor farmers to afford. Problems with fertilizer quality, arbitrage, and timeliness of fertilizer distribution persisted. High cost is another problem militating against the use of herbicides. Herbicides are good especially for clearing of weed around our environment; they cause a lot of damage by killing the non-targeted beneficial insects thereby creating more problems soon. Kughur (2012) noted that the high cost of herbicides is because of middlemen's involvement in the sale and distribution of herbicides. In order to improve crop productivity and sustainability, it is very important to evaluate the effects of human activities in soil fertility by appropriate agricultural systems such as tillage, use of recommended rates and types of fertilizer, incorporation of farmyard manure and/or crop residues into the soil (increase supply of N, P, K and other nutrients) and avoid sewage sludge irrigation. The application of these inputs improves physical properties of soil or soil organic matter in the long term and ensures sustainable agriculture. Shang *et al.* (2019) found that high crop yields and low production variability can be achieved by increasing integrated soil fertility quality index in intensive cropping systems.

Rainfall

The effects of climate change affect farmers' ability to grow the food we all need. Increasingly volatile weather and more extreme events, like floods and droughts – change growing seasons, limit the availability of water, allow weeds, pests, and fungi to thrive, and can reduce crop productivity (Shah and Wu, 2019). Rainfall regime is the most important climatic factor influencing crop cultivation activities particularly in tropical regions of Nigeria (Ayanlade *et al.*, 2010). Rainfall can vary considerably even within few distance and different time scale. This implies that crop yield is exceedingly variable over space and time which will have a big effect in determining the kind of crop to be grown, farming system to be adopted and the sequence of farm operations (Adejuwon, 2005).

Ayanlade *et al.* (2010) reported that rainfall variability is very high in most part of northern guinea Savannah (Yola, Minna, and Kaduna) except Jos which has a unique pattern and a significant relationship with tuber yield (cassava and yam). Ayanlade *et al.* (2010) further showed that rainfall pattern affects output of agricultural produce but, Owusu-Sekyere *et al.* (2011) observed that since the peak monthly rainfall is declining there is probability that lower amount of rainfall may occur in future which may have effect on crop output. Low amount of rainfall constitutes more problem to the crop farmers. A 2021 study by Cornell University found that climate change has slowed down global agricultural productivity enough to have eliminated about seven years of agricultural output growth in the last 60 years. And according to the United States Department of Agriculture (USDA), growth in global agricultural productivity slowed between 2011 and 2019 compared to previous years, meaning the world is looking at the potential reduction in agricultural output during a time of increased food needs.

Farm Machine, Tools, and Labour

Farmers still rely on the use of tools like hoe and cutlasses, these poor tools can lead to time wastage, low yield, and low farm income to the farmer. While machines are limited and expensive to hire and equally more expensive to purchase and maintain. This sometimes cannot be used in some small farm holding and some kinds of soils and also for cultivation of



some crops like yam. The importance of agricultural machinery on agricultural production cannot be overemphasised. Farmers using agricultural machinery can significantly reduce labour costs (Luo and Qiu, 2021). Furthermore, agricultural machinery can perform land levelling and land preparation, which effectively improve the utilization rate of agricultural resources and reduce the need for weed and insect pest control (Nam *et al.*, 2021). In addition, Agricultural machinery can perform the functions of levelling, land preparation, deep turning and deep scarification (Aslan *et al.*, 2007), which can improve land quality better than the traditional manual and livestock operation methods, especially in the transformation of medium- and low-yield fields (Peng and Zhang, 2020).

Poor Transportation

This includes bad roads, inadequate vehicles, and high cost of bringing the farm produce from the farm to the market and from rural to urban centres. This increases the activities of middlemen in the movement of food crops from the farm to the urban centres where they are consumed. Nigeria has significantly poor transport infrastructure and services (road and rail), particularly in the rural areas. The lack of cold chain logistics also contributes to a decreased trade capacity through losses from spoilage and impinged time to market. (Olayiran, 2020) Improving rural infrastructure such as roads is crucial to raising productivity through reductions in shipping costs and the loss of perishable produce. Meanwhile, providing better incentives to farmers, including reductions in food subsidies, could raise agricultural output by nearly 5% (Jones, 2015).

Loan volume and delay in disbursement

It was noted from the findings of the study that the amount requested by the borrower farmers were not the amount granted. In all cases, the amount granted and disbursed was lower than the one requested. The disbursement in most cases was not timely, in the sense that it is not disbursed in line with the time the farmer needed it most for farm activities. In such case, the loan is diverted for another use aside from what it was initially required for. Ekunwe *et al.* (2015) in the micro-credit access and profitability on crop production noted that untimely delivery of loan constituted the greatest constraint, a second constraint was high interest rate, and then insufficient loan volume approved. 38.3% of the borrower farmers reported small loan volume and delay in disbursement. In the same vein, as Abula and Ediri (2013) rightly observed, for a farmer to derive benefits from any institutional credit, the size of the loan is very important. Mahmud (2021) also noted that a high interest rate charged by the microfinance and the volume of loans availed to the farmers was too low for any meaningful crop production. Insufficient credit received was also reported by Vihi *et al.* (2018). Although the Nigerian government has provided several facilities through the Central Bank of Nigeria (CBN) such as the Anchor Borrower's Programme to help provide small-scale farmers with adequate financing, the farming industry still lacks adequate access to finance (Olayiran, 2020).

Storage

The lack of adequate storage and processing facilities accounts for divergence between national food security and household food security. Even if the total production of food seems adequate at the aggregate level, it will not lead to significant improvement in food security unless the food is available for consumption at the right time and in the right form (Olukunle, 2013). A significant quantity of products harvested in Nigeria perishes due to lack of storage and processing facilities. Simple, efficient, and cost-effective technologies for perishables, such as roots, tubers, fruits and vegetables, are not as highly developed in the country compared to the storage technologies for cereal grains and legumes. Heavy post-harvest losses occur due to inadequate storage facilities, especially in times of bumper harvests. Olukunle



(2013), noted that post-harvest food storage losses are very high, approximately 40 per cent for perishables, compared to cereal grains and pulses at about 15%. Traditional storage facilities have certain deficiencies, including a low elevated base giving easy access to rodents, wooden floors that termites could attack, weak supporting structures that are not moisture-proof, and inadequate loading and unloading facilities.

Across local government regions, most farmers store only a portion of their crops for consumption. They sell part of their crop early to get cash to pay for their immediate financial obligations, including, in some instances, repaying the production loan to the middlemen and microfinance institution.

High interest rate

High interest rates charged by most of the microfinance institute further makes the available credit not sufficient for farm use. An average of 15.9% per annum was charged as in contrast to CBN recommended charge through the Agricultural Credit Support Scheme (ACSS) funds which are disbursed to farmers and agro-allied entrepreneurs at a single-digit interest rate of 8.0% per annum (Alegieuno, 2010). This was also noted by Ekunwe *et al.* (2015) as one of the constraints in his study of micro-credit access and profitability on crop production.

The introduction of the “Regulatory and Supervisory Guidelines for Microfinance Banks (MFBs) in Nigeria” of 2005 marked a change in the Nigerian microfinance landscape. Not only did it aim at bringing all financial institutions for low-income earners under a common regulatory framework, but it also aimed at fostering a stronger profit and market orientation of the sector. At the same time, the regulatory body, Central Bank of Nigeria (CBN), mandates microfinance banks in providing financial services to the poor, who mainly constitute the 65% excluded from access to financial services of conventional banks and for poverty alleviation (CBN, 2005).

Gyimah and Boachie (2018) reported that microfinance is known as a provision of a wide range of financial services such as credit, insurance, savings, deposit, and payment services to poor and low-income households who are excluded from conventional financial services for lack of collateral together with non-financial services. These different overarching goals of operating financially sustainable and profitably on the one hand, while fostering social inclusion and alleviating poverty on the other is usually referred to as the double-bottom line of MFBs. This double-bottom line has several ramifications for the process of pricing microloan products: for one, prices for microloans must be high enough to ensure reasonable returns for the MFB; it is obvious that some markup must be charged on loans in order to reflect the risks associated with low-income borrowers and the lack of collateral (Ledgerwood, 1998). Moreover, low-income earners usually are less financially literate and thus can be more easily burdened with hidden costs. Finding “the right price” for microloans is thus a balancing act between the MFBs’ goals of profit maximization and providing fair conditions to low-income clientele (Bernhardt *et al.*, 2015)

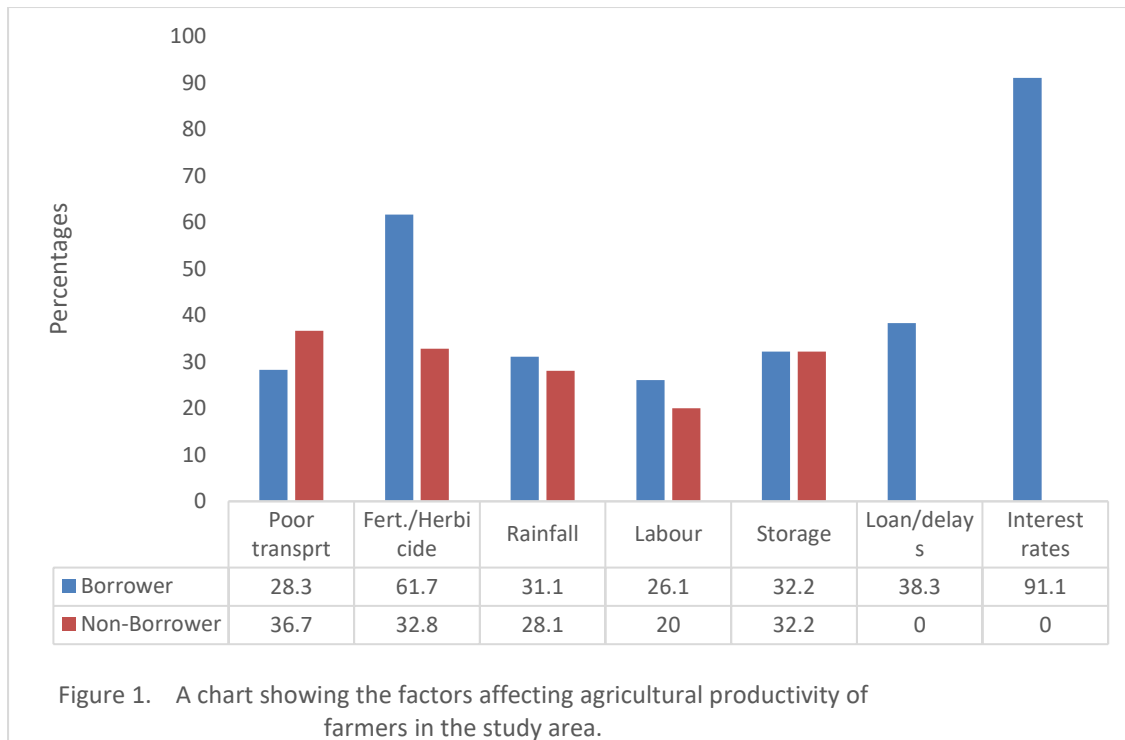


Figure 1: *Summary of Problems faced by Crop farmers in the Study Area.*

CONCLUSION AND RECOMMENDATIONS

The study concludes that though several factors tend to impede the potentiality of agricultural productivity, the key factors being access to fertiliser and herbicides, rainfall regimen, transportation, and access to credits. These to certain degrees have hindered productivity of the farmers. Though climate influences all components of crop production including crop area and crop intensity, it could be mitigated. In general, the application of inappropriate agronomic practices such as untimely planting, incorrect plant spacing, wrong method of planting, poor sowing depth, delayed weeding, ineffective pest and disease control, inappropriate use of fertilizers, untimely harvesting, and use of low yielding varieties, will always significantly reduce crop yields. The study recommended as follows:

1. Since the federal government has removed subsidy on almost all agricultural inputs, farmers could form cooperative organisations to ease accessing these inputs timely and adequately rather than individually.
2. Extension services agencies could be airing farm related information every now and then as most farmers now could easily use their phones to tune onto the programmes. This could create a lot of awareness on weather forecast information' and how to mitigate weather problems.

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