



## **Perception of the Constraints Affecting Maize Production in the Agricultural Zones of Kogi State, North Central, Nigeria**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Author HIO designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Author SOA collected and prepared the data from the field survey for analysis while author SOU managed the literature searches. All authors read and approved the final manuscript.*

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### **ABSTRACT**

The study focused on the perception of the constraints affecting the production of maize in the agricultural zones of Kogi State, North Central Nigeria. The data for the study were collected in 2012 from 100 respondents from each of the four agricultural zones in the study area giving rise to a total of 400 maize farmers through a multistage sampling technique by the use of structured questionnaire. The collected data were analyzed through analysis of variance (ANOVA). The study categorized the constraints faced by maize farmers in the study area into production and distributional constraints. The result of the study on the production constraints showed that even though these constraints existed in zone A, it was not as serious as those in other zones. It further showed that low productivity, lack of improved varieties, inadequate/lack of mechanical services (such as tractor hiring), lack/inadequate access to herbicides and inaccessibility to good roads

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were perceived to be prevalent in agricultural zone B while lack of education and technical skills and lack/inadequate access to fertilizers were perceived serious in zone C. Farmers in zone D perceived that high interest rate on borrowed funds, land ownership, scarcity of labour, high cost of production and poor credit accessibility to be the major constraint affecting their maize production activities. The outcome of the distributional constraints indicated that all the constraints studied were more severe in zone B than those in other zones of the study area. These constraints are; fluctuating prices of outputs, inadequate storage facilities, poor marketing facilities, poor market information, lack/inadequate access to good transportation facilities, Inadequate processing facilities and lack of finance. The study concluded by advocating that policy engendering should be location specific due to the peculiarity of the constraints faced by the farmers and the difference in the environments where maize is produced.

*Keywords: Maize; constraints; perceived; north central; Kogi, Nigeria.*

## 1. INTRODUCTION

Even though the Nigerian economy is presently dependent on the oil sector, agriculture still remains paramount in the transformation of rural economies, in that it provides foods, income and means of livelihood to rural communities. Time there was when Nigeria was a major exporter of agricultural commodities but later became a net importer of food. This unpleasant situation of the agricultural sector has drawn the attention of successive government regime. They expressed their concern by introducing agricultural policies and programs which according to [1] failed due to poor conceptualization, official corruption, bureaucratic bottle necks, misplaced priorities and poor project co-ordinations among others.

Available statistics from [2] has it that 70 percent of the 140 million Nigerian populations engage in agricultural production. Bulk of the food supply to urban areas comes from the agricultural population most of who are small holder farmers. These farmers are poor with low income, rely on rain fall, use crude farming tools with little or no mechanization, lack adequate extension services and often experience low productivity [3] Cited in [4,5]. According to [6], the world is currently faced with the challenge of both developing adequate and safe methods of boosting food production, as well as evolving sound strategies of ensuring equitable food distribution. The food production rate has continued to fluctuate while food demand has continued to be on the increase [7].

According to [8] maize is the third commonest cereal cultivated in Nigeria, for human consumption, livestock feeds and raw materials for industries. Maize is one of the major food staples especially in developing countries of the world and has gained economic importance in the last two decades and accounts for 80-90% of

the total caloric intake among some rural population, though it has low protein and vitamins content [9,10]. Every part of the maize plant has economic value: the grain, leaves, stalk, tassel, and cob can all be used to produce a large variety of food and non-food products (IITA, 2009). Maize is prepared and consumed in a multitude of ways which vary from region to region or from one ethnic group to the other. [11] reported that maize can be boiled or roasted on the cob, the grains can be cooked fresh or dry and the dry grain can be made into pop corn (*guguru*) and eaten with roasted groundnuts. Maize has become a staple food of great socio – economic sources in Nigeria and has gained economic importance in the last two decade [12]. [13] Identified industrial utilization of maize to include the production of flour, sugar, starch, alcohol, spirit and other value-added products from milling of corn.

The study focuses on the agricultural zones of Kogi State, North Central Nigeria because of their large involvement in the production and consumption of maize which serve as a major staple food among rural households in the study area. Despite the importance of maize in the sustenance of livelihood in rural areas of Kogi State, it's all year round affordability cannot be guaranteed. This is as a result of the production and distributional constraints experienced by maize farmers in the agricultural zones of the study area. This has led to low productivity and inequitable distribution of maize in the study area. The average price of a 100kg bag of maize goes for ₦3, 000.00 between August and November but three months later, it rises to ₦5, 200.00. Forty percent (40%) of the population cannot support this price change thus look for alternatives. The questions that easily come to mind are; what constraints affect the production of maize in the study area? What then is the way forward? Giving the economic value of maize in

the study area, it is expedient to mitigate these constraints affecting its production. Thus to this end, this study seek to undertake the perception of constraints affecting maize production in the agricultural zones of Kogi State, Nigeria.

## 2. MATERIALS AND METHODS

The study was conducted in Kogi State, North Central Nigeria. The study area is located between latitude 6°30'N & 8°48'N and longitude 5°23'E & 7°48'E. The sampling frame for the study consisted of 12,467 maize registered farmers with the Kogi Agricultural Development Program (KADP). The sample size was estimated to be 400 farmers using the formula by [14] cited in [15].

A multi-stage random sampling technique was employed in the selection of the sample for this study. The first stage comprised the random selection of two (2) Local Government Areas from each of the four agricultural zones in the study area. These zones are A, B, C and D. This summed up to eight (8) Local Government Areas. The second stage consisted of the random selection of two communities from each of the selected Local Government Areas. This gave rise to a total of 4 communities per agricultural zone. The third stage involved the random selection of twenty five (25) maize farmers from each of the randomly selected communities, this summed up to 100 maize farmers to whom copies of questionnaire were administered. Form the four agricultural zones a total of 400 respondents were used for analysis.

### 2.1 Analysis of Variance (Anova)

For the purpose of this analysis, 100 respondents from each of the agricultural zones served as the replicates. The seriousness of a specific problem was measured using a five point scale. These are Very Serious = 1, Serious =2, Undecided =3, Not Serious=4 and Not Very Serious=5.SAS Statistical package was used for the analysis and was tested at  $p=.05$ .Least Significant Difference was used to separate the means. The closer the mean of the constraint to zero the more serious the constraint.

## 3. RESULTS AND DISCUSSION

### 3.1 Production Constraints Affecting Maize Production

Table 1 shows the mean comparison of the perceived production constrains affecting the

production of maize across the agricultural zones of Kogi State. Colum mean with the same letter superscripts are comparable or not significantly different at  $p=.05$ , implying that the constraint in question is perceived the same across the agricultural zones. In the same vain Colum mean with different letter superscripts are significantly different at  $p =.05$  or not comparable. This implies that the constraint in question is perceived differently in the agricultural zones. The closer the mean of the constraint to zero, the more serious the constraint. All the constraints studied were significant at  $P=.05$

The analysis of the result of the production constraints affecting maize production in the study area shows that even though these constraints existed in agricultural zone A, they were not perceived to be serious as those in other zones. The problem of low productivity, lack of improved varieties, inadequate/lack of mechanical services (such as tractor hiring), lack/inadequate access to herbicides and inaccessibility to good roads were perceived by the respondents to be serious challenges in agricultural zone B. The finding on the problem of low productivity is consistent with [16] who posited that all Year-round grain availability is low in Nigeria owing to a combination of low productivity and high post-harvest losses. According to [17] majority of maize farmers in Ogori / Magongo Local Government Area of Kogi State, Nigeria are faced with the problem of improved seeds because they use seeds from previous harvest which most of the time is not viable and result to poor yield. The outcome of the study on the Inadequate/Lack of mechanical services (such as tractor hiring) in zone B is in line with [18] who affirms that farm operations from land clearing to crop harvesting and processing are carried out by hand using simple tools such as hoe, cutlass, axe, sickle and other local farm implements by the majority of Nigeria farmers. Most of the food crop production processes in Nigeria is not usually mechanized, this constitute a very serious challenge for maize farmers because most agricultural operations are tedious in nature. The findings on inaccessibility to good roads is inconsonance with the works of [19] who identified poor transportation and communication networks in terms of access roads due to difficult terrain in some parts of nation which makes transportation of agricultural products to the market gate very difficult especially during the rainy season as a major problem faced by farmers.

The more prominently perceived constraints affect maize farmers in zone C are lack of education and technical skill and lack/inadequate access to fertilizers. Farmers in zone D perceived that high interest rate on borrowed funds, land ownership, scarcity of labour, high cost of production and poor credit accessibility to be the major constraint affecting their maize production activities. The pattern of land ownership in rural communities in Nigeria makes it difficult for farmers to acquire large expanse of land for production which according to [20] constrain agricultural development

### 3.2 Distributional Constraints Affecting Maize Production

Table 2 shows the mean comparison of the perceived distributional constraint affecting the production of maize across the agricultural zones of Kogi State. Colum mean with the same letters

are comparable or not significantly different at  $p=.05$ , implying that the constraint in question is perceived the same across such zones. In the same vain Colum mean with different letters are significantly different at  $p =.05$  or not comparable. This implies that the constraint in question is perceived differently in such zones. The closer the mean of the constraint to zero, the more serious the constraint. All the constraints studied were significant at  $P=.05$ . The analysis of the result across the agricultural zones reveals that all the distributional constraints studied were more severe in zone B than other zones in the study area. Even though these constraints existed in the other zones, they were not perceived to be as serious as those of zone B. A related study carried out by [10] in Kogi State reported that maize farmers were constrained by lack of Storage facilities, high cost of transporting, lack of access road and poor pricing of maize produce.

**Table 1. Mean separation of perceived production constraints affecting maize production in the agricultural zone of Kogi State**

Constraints	Zones				SEM	P-value
	A	B	C	D		
High interest rate on borrowed funds	1.70 <sup>b</sup>	1.40 <sup>c</sup>	2.09 <sup>a</sup>	1.20 <sup>c</sup>	0.05	0.000
Problem of land ownership	2.99 <sup>a</sup>	1.84 <sup>cb</sup>	2.13 <sup>b</sup>	1.64 <sup>c</sup>	0.07	0.000
Scarcity of labour	1.46 <sup>b</sup>	2.42 <sup>a</sup>	2.14 <sup>a</sup>	1.21 <sup>b</sup>	0.06	0.000
Low productivity	2.87 <sup>a</sup>	1.71 <sup>c</sup>	2.08 <sup>b</sup>	3.00 <sup>a</sup>	0.07	0.000
Lack of improved varieties	2.28 <sup>b</sup>	1.84 <sup>c</sup>	2.21 <sup>b</sup>	3.52 <sup>a</sup>	0.06	0.000
Lack of education and technical skill	2.65 <sup>b</sup>	2.27 <sup>c</sup>	1.72 <sup>d</sup>	3.77 <sup>a</sup>	0.07	0.000
Inadequate/Lack of mechanical services (such as tractor hiring)	1.58 <sup>a</sup>	1.20 <sup>b</sup>	1.24 <sup>b</sup>	1.51 <sup>a</sup>	0.04	0.000
Lack/inadequate access to fertilizers	2.05 <sup>b</sup>	1.54 <sup>c</sup>	1.37 <sup>c</sup>	2.79 <sup>a</sup>	0.06	0.000
Lack/inadequate access to herbicides	2.77 <sup>b</sup>	2.00 <sup>c</sup>	2.12 <sup>c</sup>	3.69 <sup>a</sup>	0.07	0.000
Inaccessibility to good roads	2.11 <sup>a</sup>	1.36 <sup>b</sup>	1.56 <sup>b</sup>	2.08 <sup>a</sup>	0.06	0.000
High cost of production	1.94 <sup>a</sup>	1.33 <sup>c</sup>	1.70 <sup>b</sup>	1.07 <sup>d</sup>	0.04	0.000
Poor credit accessibility	2.35 <sup>a</sup>	1.17 <sup>c</sup>	1.73 <sup>b</sup>	1.11 <sup>c</sup>	0.03	0.000

*Colum mean having the same letter superscripts are not significantly different at  $p=.05$ ; SEM-Standard error of mean; Source: Computed From Field Survey Data 2012*

**Table 2. Mean separation of perceived distributional constraints affecting maize production in the agricultural zone of Kogi State**

Constraints	Zones				SEM	P-value
	A	B	C	D		
Fluctuating prices of output	1.37 <sup>c</sup>	1.02 <sup>d</sup>	1.94 <sup>b</sup>	2.71 <sup>a</sup>	0.06	0.000
Inadequate storage facilities	1.94 <sup>a</sup>	1.33 <sup>b</sup>	1.48 <sup>b</sup>	1.82 <sup>a</sup>	0.05	0.000
Poor marketing facilities	2.40 <sup>b</sup>	1.30 <sup>d</sup>	1.76 <sup>c</sup>	2.90 <sup>a</sup>	0.06	0.000
Poor market information	2.50 <sup>b</sup>	1.45 <sup>c</sup>	1.70 <sup>c</sup>	3.12 <sup>a</sup>	0.07	0.000
Lack/inadequate access to good transportation facilities	1.71 <sup>ba</sup>	1.51 <sup>b</sup>	1.73 <sup>ba</sup>	1.86 <sup>a</sup>	0.05	0.05
Inadequate processing facilities	1.86 <sup>a</sup>	1.34 <sup>b</sup>	1.51 <sup>b</sup>	1.50 <sup>b</sup>	0.04	0.000
Lack of finance	2.54 <sup>a</sup>	1.20 <sup>b</sup>	1.30 <sup>b</sup>	1.26 <sup>b</sup>	0.06	0.000

*Colum mean having the same letter superscripts are not significantly different at  $p=.05$  SEM-Standard error of mean; Source: Computed From Field Survey Data 2012*

#### 4. CONCLUSION AND RECOMMENDATIONS

This study attempted to analyze the constraints affecting maize production in the agricultural zones of Kogi State, North Central Nigeria. The study found out that the seriousness of some constraints in some agricultural zones was due to the differences in the production environment in which maize is produced. Analysis of the production constraints indicated that these constraints were not perceived serious in zone A compared to other zones. The prevalent constraints in zone B were low productivity, lack of improved varieties, inadequate/Lack of mechanical services (such as tractor hiring), lack/inadequate access to herbicides and Inaccessibility to good roads while those in zone C were lack of education and technical skill and lack/inadequate access to fertilizers. The perceived major constraints in zone D were high interest rate on borrowed funds, problem of land ownership, scarcity of labour, high cost of production and poor credit accessibility. All the distributional constraints studied were more serious in zone B than other zones.

It is therefore advocated that giving the peculiarity of the constraints faced by the different agricultural zones, policy engendering should be location specific. It on this premise that the study recommends that policies and program that will increase productivity, provide inputs, mechanize services and good roads should be given due attention in agricultural zone B while those that promotes farmers education and effective extension services to facilitate technology transfer should be embarked upon in zone C. Policies that will reduce interest rate, make land accessible, provide subsidies and credit to farmers should be promoted in zone D. The study further recommends that in other to handle the distributional constraints perceived more serious in agricultural zone B, policies that will grantee prices, provide adequate storage and processing facilities, adequate market information and facilities, good road and finance should be facilitated.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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