# EFFECT OF CRISIS ON YAM PRODUCTION IN SOUTHERN AGRICULTURAL ZONE, NASARAWA STATE, NIGERIA

*Abstract*
*The study analyzed effect of crisis on yam production in Southern Agricultural Zone, Nasarawa State, Nigeria. The specific objectives were to; determine the effect of socio-economic variables on yam production, determine the factors affecting yam production, and to compare the gross margin of yam production before and after crisis in the study area. A multi-stage sampling procedure was adopted for this study and a total of sixty (60) respondents were sampled for this study. Data were collected through the use of structured questionnaires and analyzed using descriptive statistics which involves use frequency, percentages and the gross margin analysis. The study revealed that before the conflict the total variable cost was 233,288.4 while after the conflict in table 2, the total variable cost was 172310. The study conclude that price of fertilizer was doubled after conflict thereby reducing production. The result shows that 17.6% of the respondent's stopped producing yam because of the fear of conflict. And also, there was a reduction in food production between the period of the conflicts and peaceful disposition. The study therefore recommend that government should develop policies and strategies to curtail future occurrence of crisis among farmers and herdsmen, and focus more on giving incentives to farmers and subsidy on farm inputs such as fertilizer, improved varieties, chemicals among others to boost food crop production, farmers income level and to ensure maximum security on lives and properties of prospective citizens and farmers.*
*Keywords: Crisis; Factors; Yam Production;*

## I. INTRODUCTION

Yams (*Dioscorea species*) are annual root tuber-bearing plants with more than 600 species out of which six are socially and economically important in terms of food cash and medicine (IITA, 2009). Some of the yam species are water yam (Dioscorea alata), white yam (*Dioscorea rotundata*), yellow yam (*Dioscorea cayanensis*), chinese yam (*Dioscorea esculanta*) and three-leaf yams (Ike and Inoni, 2006; Zaknayiba and Tanko, 2013). Conflict between farmer and nomadic cattle herder have been a common feature of economic livelihood in west Africa (Tonah, 2006) in the period before the beginning of 20th Century, the problem was mainly restricted to the savanna belt of West Africa. Cattle rearing were mainly prevalent in the Guinea. Sudan and Sahel Savanna belt where crop production was carried out only during the short rainy season on a small scale. This gave the Cattle herder access to a vast area of grass land. As time went on, and with introduction of irrigated farming in the Savanna belt of Nigeria, and the increased withering of pasture during the dry season, less pasture was available to cattle herders. This gave rise to an increased pressure on natural resources and a stiff competition for available resources between farmers and herders (Adebayo, 1997; Breuser *et al.*, 1998; Bermadet, 1999). Tonah (2006) is of the view that since the Sahel drought of the 1970s and 1980s, the accompanying migration of a huge number of pastoralist into the fringes of the humid forest zone of west Africa, there has been a massive increase of the incidence of farmers-herders conflict are wide spread in Nigeria, in recent times for instance, in obi local government of Nasarawa State, people were displaced and rendered homeless in the host community in the hostility between cattle headsmen and farmers in the host community between two communities for one reason or the other. Many farmers have lost their lives and herds, while others have experienced dwindling productivity

in their farms. Some studies (Ayanuyi *et al.*, 2011; Klein *et al.*, 2012), stressed that low soil fertility, lack of improved yam varieties, poor road networks, high cost of labour and lack of finance to carry out necessary farming activities were the constraints to productivity. Yams like many other crops in Nigeria are labour intensive. The high cost of labour has been among the major constraints to yam production. It has constrained smallholder yam farmers from enhancing productivity (Ayanwuyi *et al.*, 2011; Migap and Audu, 2012). The labour cost of yam production from mounding to staking, especially in the forest areas account for approximately 40% cultivation costs. In addition about 50%of the expenditure goes to the planting process (IITA, 2009). In order to cut labour cost, most family members practically do all the production and marketing activities themselves. Ike and Inoni (2006) and Okeoghene *et al.*, (2013) confirmed that over 65% of smallholder farmers used family labour in Delta state; Nigeria. The conflicts are a threat to peace and national stability. It also has implication for tribal co-existence in Nigeria being a multi-ethnic and multi-tribal nation. One major constraint highlighted for its contribution to declining yam productivity and marketing in the research area is crisis due to disputes between two communities and competition for limited resources between cattle herdsmen and crop farmers. The result of the study would be useful for a further understanding of farmers-herders conflicts in the southern agricultural zone of Nasarawa state and other local governments in Nasarawa state, Nigeria. It would also give an insight into the way forward in such conflict situations. Therefore, the study seeks to address the following research questions.

What are the socio-economic characteristics of the affected farmers in the study area?

What are the factors affecting yam production in the study area?

What is the gross margin of yam production before and after crisis in the study area?

**Objectives of the study**

The objectives of the study are to;

determine the effect of socio-economic variables on yam production in the study area.

determine the factors affecting yam production in the study area.

compare the gross margin of yam production before and after the conflicts in the study area.

**Hypothesis**

Ho: There is no significance difference between the factors affecting yam production and gross margin of yam production before and after the crisis.

## II. METHODOLOGY

This study was carried out in Southern Agricultural Zone of Nasarawa State, Nigeria. The State lies between latitude $07^0 45^0$N and $09^0$ 25E of the equator and longitude $09^0 37$E of the Greenwich meridian. It shares boundary with Kaduna State in the North, Plateau State in the East, Taraba and Benue State in the South, while Kogi and Abuja in the West (Binbo and Marcus, 2005). Nasarawa State has altitude of 181.5m above sea level and comprises of thirteen Local Government Areas viz; Akwanga, Wamba, NasarawaEggon, Awe, Obi, Keana,

Lafia, Doma, Kokona, Keffi, Toto, Nasarawa, and Karu. The study area which is Southern Agricultural Zone of Nasarawa State Comprises of five local government areas which are Lafia, Keana, Awe, Doma, and Obi. The zone is characterized by long period of rainy season (March – October). The study area has a tropical climate with two main season's namely wet and dry season. The soil structure of the area is sandy loam which is suitable for farming. The major crops produced in this area includes yam, sesame (Beniseed) groundnut, melon, cassava, cowpea, maize, rice, sweet potato, guinea corn, and some fruit such as paw-paw, cashew, orange and guava, farmers in the study area also keep livestock like cattle, poultry, goats and sheep.
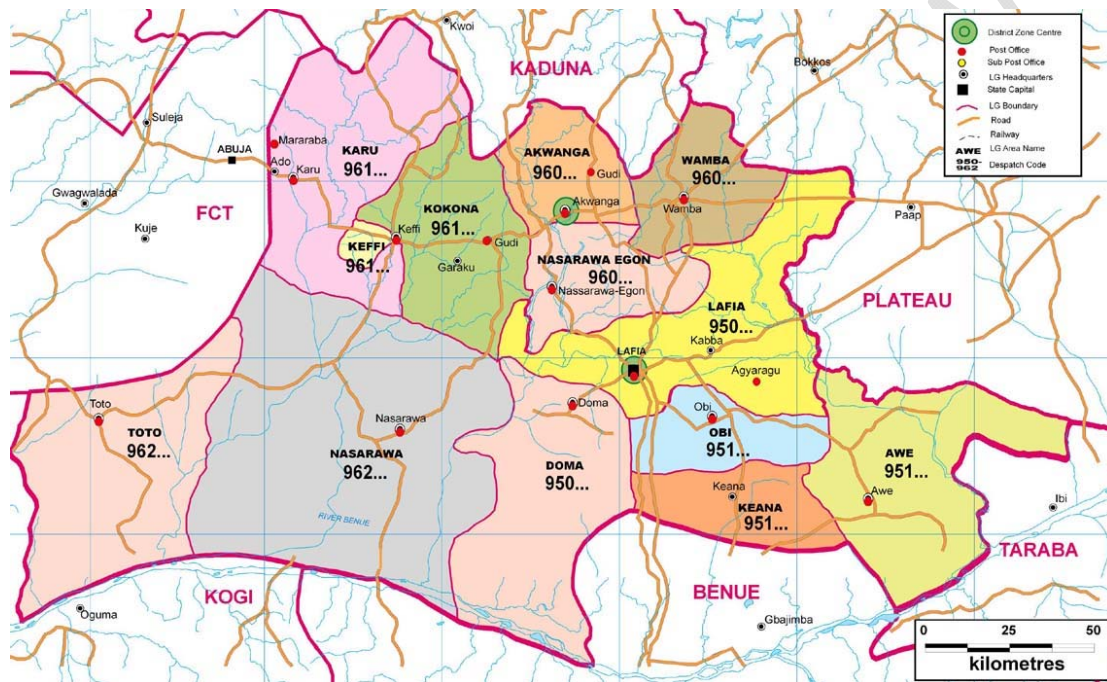


**Figure 1: Map of Nasarawa state showing the Southern Agricultural Zone**
**Sample size and sampling technique**

A multi-stage sampling procedure was adopted for this study. First, three (3) Local Government Areas (LGAs) in the zone were randomly selected out of the five (5) Local Government Areas. Secondly, four (4) farming community (villages) were then randomly selected from each of the three (3) selected Local Government Areas to give a total of twelve (12) villages. In the third stage, five (5) farmers were also randomly selected from each of the twelve (12) villages to give a total of sixty (60) respondents which formed the sample size for this study.

**Data collection**
The primary data was collected through the use of structured questionnaire and group discussion. Information that was collected from the respondents covers all the objectives.

**Data analysis**

A simple descriptive statistics involving frequency counts, percentage and mean score was used to analyze the socio-economic variables on yam production and factors affecting yam production, while gross margin analysis was used to analyze the gross margin of yam production before and after crisis in the study area.

Arithmetic mean will be computed according the following formulae;

$$\bar{X} = \sum \frac{X_i}{N} = \frac{X_1 + X_2 + X_3 \dots\dots\dots\dots\dots X_n}{N} \dots\dots\dots\dots\dots\dots (1)$$

Where

$\bar{X}$ - Mean

$\sum X_i$ = summation of the sample

N = Total number of observations

$\Sigma$ = Summation

Xi = Individual observation

N = Total number of observation

Percentage is mathematically expressed as:

$$Percentage\ (\%) = \frac{X}{N} \times 100 \dots\dots\dots\dots\dots\dots (2)$$

Where:

% = Percentage

X = Individual observation

N = Total observation

**The gross margin analysis is specified as**

GM = TR – TVC

Where

GM = Gross margin

TR = Total revenue generated from crops

TVC = Total variable cost.

## III. RESULTS AND DISCUSSION

**Socio-Economic variables of Respondents on Age, Gender and Marital status.**

**Age:** The results from table 1a, revealed that majority 41.7% of the respondents were between the ages of 31-40 years followed by 36.7% who were between the ages 20-30 years. These indicate that most of the respondents were still strong and energetic to participate in agricultural activities. This is in consonance with the findings of Ogumbameru (2001), who asserted that young and middle aged people were the most active in agricultural production activities for increased productivity.

**Gender:** The results also revealed that majority 90.0% of the respondents in the study area were men while only 10.0% were women. This indicates that yam production in the study area were among the male gender than the female. This might be attributed to fact that

household heads are responsible for major production decisions, hence agreeing with (Johnson, Dingkuhn and Jones 1998).

**Marital Status:** Also, results from the findings indicated that majority 87.1% of the respondents were married whereas 11.7% were single, 33.3% were divorced and 33.3% were widowed respectively. The high number of married respondents could increase the release of family labour, thus making more hands available for productive activities on respondent's yam farms. This is in line with Akimbile (2007), who indicated that married people accounts for majority of farmers' population.

**Table 1A: Socio-Economic variables on Age, Gender and Marital status**
**Source: Field survey, 2018**

**Socio-Economic variables of Respondents on Age, Gender and Marital status.**

| Characteristics | Frequency | Percentage |
|---|---|---|
| Age (years) | | |
| 21-30 | 22 | 36.7 |
| 31-40 | 25 | 41.7 |
| 41-50 | 10 | 16.7 |
| 51-60 | 3 | 5.0 |
| Total | **60** | **100.0** |
| Gender | | |
| Male | 54 | 90.0 |
| Female | 6 | 10.0 |
| Total | **60** | **100** |
| Marital status | | |
| Single | 7 | 11.7 |
| Married | 49 | 81.7 |
| Divorced | 2 | 3.3 |
| Widowed | 2 | 3.3 |
| Total | **60** | **100.0** |

**Source:** Field survey, 2018

**Educational Level:** The result in Table 1b, revealed that majority 38.3% of the respondents have obtained secondary school qualification, 21.7% have primary education, 23.3% having tertiary education and then 1.7% having adult education. This indicates that majority of the respondent in the study area are educated enough to understand how to use their inputs efficiently. Muneer (2008) reports that educated farmers are more innovative and knowledgeable. The high number of literate people among the farming population indicates that majority of them are in a better position to adopt new technologies exposed to them. Education has always been known to play a positive role in the adoption of improved technologies among farmers Negash (2007).

**Family Size:** The result presented in Table 1b also revealed that majority 45.0% of the respondents were found to have family size of 5-10 persons per household, 30.0% has less than 5 persons, and 25.0% has above 10 persons per household.

**Farming Experience:** The result in Table 1b also revealed that majority 35.0% of the respondents were found have a farming experience of 20years and above, 26.7% has 5-10 years farming experience, 21.7% has 16-20years farming experience, 15.0% has 11-15years farming experience.


**Table 1B: Socio-Economic variables on Educational status, Family size and Years of Farming Experience**

| Characteristics | Frequency | Percentage |
|---|---|---|
| **Educational Status** | | |
| Primary | 13 | 21.7 |
| Secondary | 23 | 38.3 |
| Adult education | 1 | 1.7 |
| Tertiary | 14 | 23.3 |
| Total | **60** | **100.0** |
| **Family size** | | |
| Less than 5 | 18 | 30.0 |
| 5-10 | 27 | 45.0 |
| Above 10 | 15 | 25.0 |
| Total | **60** | **100.0** |
| **Years of Farming Experience** | | |
| Less than 5 | 1 | 1.7 |
| 5-10 | 16 | 26.7 |
| 11-15 | 9 | 15.0 |
| 16-20 | 13 | 21.7 |
| **Above 20** | 21 | 35.0 |
| Total | 60 | 100 |

Source: Field Survey, 2017


**Gross margin of yam production before and after conflict**

Table 2 shows the gross margin of yam production before and after the conflict. It was observed that before the conflict the total variable cost was 233,288.4 while after the conflict in table 2, the total variable cost was 172310.The drop in production of yam was because during the conflict the yam farmers loss their produce, houses/facilities were destroyed and they also lose some of their family members in the cost of the conflict which indirectly reduced the numbers of laborers' in the affected area thereby affecting production.

Comparing the results of the production levels before and after the conflicts. It can be concluded that there was a reduction in food production between the period of the conflicts and peaceful disposition. This agreed with Messers*et al.,* (2001) who reported difference in the level of production between the period of war and peaceful disposition and their contribution to regional agricultural production level.

**Table 2a; Gross Margin before Conflict**

| Cost and return item | Mean value Before conflict | % | Mean value After conflict | % |
|---|---|---|---|---|
| (a) Variable Cost (VC) | | | | |
| Fertilizer | 4,350.0 | 1.86 | 5258.33 | 3.05 |
| Labour | 15,266.7 | 6.54 | 6866.7 | 3.98 |
| Cost of yam | 212,266.7 | 90.9 | 158,641.7 | 92.06 |
| Herbicide | 1405.0 | 0.6 | 1543.3 | 0.89 |
| Total Variable Cost (TVC) | 233,288.4 | | 172,310 | |
| (b) Fixed Cost (FC) | | | | |
| Land | 13,850.7 | | 17,4408 | |
| Implement | 3,281.8 | | 4,565.6 | |
| Total Fixed Cost (TFC) | 17,132.5 | | 22,006.4 | |
| (c )Total Cost (TC)= TVC+TFC | 250,420.9 | | 194,316.4 | |
| (d) Total Revenue (TR) | 1,431,933.3 | | 664,101.7 | |
| Net Farm Income (NFI)= TR-TC | 1,181,512 | | 469785.3 | |
| Gross Margin= TR-TVC | 1,198,644.9 | | 491791.7 | |
| Return per Naira invested | 5.13 | | 2.85 | |

**Table 2b; Gross margin after conflict**

| Cost and return item | Mean value | Percentage of variable cost |
|---|---|---|
| (a) Variable Cost (VC) | | |
| Fertilizer | 5258.33 | 3.05 |
| Labour | 6866.7 | 3.98 |
| Cost of yam | 158,641.7 | 92.06 |
| Herbicide | 1543.3 | 0.89 |
| Total Variable Cost (TVC) | 172,310 | |
| (b) Fixed Cost (FC) | | |
| Land | 17,440.8 | |
| Implement | 4,565.6 | |
| Total Fixed Cost (TFC) | 22,006.4 | |
| (c )Total Cost (TC)= TVC+TFC | 194,316.4 | |
| (d) Total Revenue (TR) | 664,101.7 | |

| | |
|---|---|
| Net Farm Income (NFI)= TR-TC | 469785.3 |
| Gross Margin= TR-TVC | 491791.7 |
| Return per Naira invested | 2.85 |

Source: Field survey, 2017

**Factors Affecting Yam Production**

Table 3 shows the factors affecting yam production in the study area after the conflicts, it was observed that poor extension services which constitute 32.4% really affected yam production in the study area, extension which serve as link between the farmers and researchers was inadequate to some extent in the study area.The results revealed that 14.7% of the respondents were unable to access inputs such as fertilizer, yam seeds, labourers and capital among others. The results also revealed that 35.3% of the respondent's production declined due to increase in price of inputs such as fertilizer which constitute a major constraint of production. These findings is in consonance with the works by Zaknayiba and Tanko (2013); Ike and Inoni (2006); Maikasuwa and Ala (2013), who find that lack of access to farm inputs, high cost of inputs, high incidence of pests and diseases have negatively affected yam production. It was observed that before the conflict the price of fertilizer was ₦3,500/bag(50kg) (Government price) and after the conflict due to lack of government intervention in the study area, the fertilizer passed through middle men and on getting to the farmers the price changes to ₦7,500/bag(50kg), Thereby making the fertilizer not affordable and available for majority of the farmers leading to reduction in quantity of fertilizer used which will definitely reduce yield because a farmer who cultivate 3 hectare (ha) of yam is expected to reduce to 1ha or 2ha. In conclusion the price of fertilizer was doubled after conflict thereby reducing production.The result shows that 17.6% of the respondent's stopped producing yam because of the fear of conflict.

**Table 3:Constraints to yam production**

| Factors | Frequency | Percentage |
|---|---|---|
| Poor extension service | 55 | 32.4 |
| In accessibility of input | 25 | 14.7 |
| Increase in price of input | 60 | 35.3 |
| Fear of conflict | 30 | 17.6 |
| Total | 170 | 100 |

Source; Field survey, 2017

## IV. CONCLUSION AND RECOMMENDATION

**Conclusion**
The result reveals that majority 41.7% of the respondents were between the ages of 31-40 years followed by 36.7% who were between the ages 20-30 years. These indicate that most of the respondents were still strong and energetic to participate in agricultural activities. It also shows that 17.6% of the respondent's stopped producing yam because of the fear of conflict. And also, there was a reduction in food production between the period of the conflicts and peaceful disposition. In conclusion the price of fertilizer was doubled after conflict thereby reducing production. The study therefore recommend that government should develop policies and strategies to curtail future occurrence of crisis among farmers and herdsmen, and focus more on giving incentives to farmers and subsidy on farm inputs such as fertilizer, improved varieties, chemicals among others since the respondents were still very young and active who can engage in agriculture to boost crop production, farmers income level and to ensure maximum security on lives and properties of prospective citizens and farmers.

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