

Investigating the Place of Population Increase and Level of Income Earning in Food Security A Study of Yam Supply in Awka Urban, Anambra State of Nigeria

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ABSTRACT

This research was carried out to present yam supply and food security situation in Awka urban, Anambra State. Data used were collected through questionnaires and oral interview, using the simple random sampling to select the respondents. The Pearson Product Moment Correlation was employed in testing the hypotheses formulated. It was found out that there is a significant relationship between population increase and yam supply and that there is a significant relationship between the income of the consumers and yam consumption. The increase in the population in Awka urban has led to a decrease in food production causing the people to look outward for food supply. This can be averted if agricultural productivity is increased and more jobs are provided for the people to earn income to purchase food.

INTRODUCTION

1.1 Background of Study

Food security refers to the availability of food and access to it. A household is considered food secure when its occupants do not live in hunger or fear of starvation. The World Food Summit of 1996 defined food security as existing “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”.

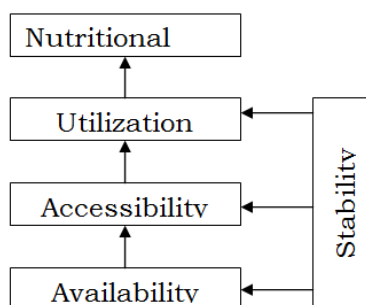
In the proceedings of the 1974 World Food summit, food security was defined as “availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices (UN 1975). This is also partially contained in the millennium development goals (UNDP 2004).

In 1983, the Food and Agricultural Organization expanded the concept to include a third prong: “ensuring that all people at all times have both physical and economic access to the basic food that they need (FAO, 1983). In 1986, the World Bank report, “Poverty and Hunger” The concept was further elaborated in terms of access of all people at all times to enough food for an active, healthy life”. The focus was on the temporal dynamics of food insecurity.

Later in 1996, the World Food Summit adopted a complex definition: Food Security, at the individual, household, national regional and global levels is achieved when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”.

The definition of food security was redefined by the FAO (2002) to be “a situation that exists when all people, at all times, have, physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”. This definition has been widely adopted by the countries of the world.

According to the USAID, the concept has four dimensions; food availability, food access, food utilization and food stability (USAID 1992). Gross et al. (2000) also reaffirms that the concept consists of these four dimensions. This is shown in the figure below.



Source: Gross et al (2002)

Fig 1: Elements of Food Security

Worldwide around 852 million people are chronically hungry due to extreme poverty, while up to 2 billion people lack food security due to poverty (FAO, 2008). The increase in the price of biofuels, population growth, climate change, loss of agricultural land to residential and industrial development have pushed up the price of food. This is the case in Awka urban. The recent economic slowdown in the country has deprived a good number of people access to adequate food.

More than half of the planet's population live in urban areas as of November 2007. By 2007, the population of Awka was 176,860 as opposed to about 60,000 in 1991 (National Population Commission). As the population increases, the food supplied to Awka, if not increased will lead to an urban food crisis. In this research, in terms of food supply, yam supply in Awka will be considered.

Yam (*Discorea* spp) is among the oldest recorded food crops. It is believed to have originated from the tropical areas of Africa, Southeast Asia and South America (Orkwor et al, 1998). The domestication of yam dated back to 50,000 BC (Okigbo, 1980). It contributes over 200 dietary calories everyday for over 50 million people in West Africa (Okoli et al, 1982 and Nweke et al, 1991). In West Africa, yam is grown peripherally to the forest and savanna areas in Nigeria, Ghana, Cote d'ivoire, Cameroon, Benin and Togo, Nigeria being the largest producer. Yam is important because it is a good source of energy derived from their carbohydrate, low fat and protein, and vitamin B₆. It is also a source of income to the farmers and suppliers.

1.2 Aim and Objectives

The aim of this research is to investigate the place of population increase and level of income earning in food security a study of yam supply in awka urban. To achieve this, the following objectives were pursued:

- To define the concept of food security.
- To examine the impact of population growth on food supply in the study area.
- To examine the relationship between the income of the population and food consumption in the area of study.
- To suggest efficient ways to improve yam production to sustain the increasing population in Awka urban.

1.3 Location and Site

Awka is the capital of Anambra State. It is located between latitude 6⁰11¹N and 6⁰15¹N, and longitude 7⁰04¹E and 7⁰09¹E. The city is traversed by the old Enugu road. It is bound by Okpuno to the Northwest, Amansea to the Northwest, Nibo and Amaobia to the Southwest, and Mgbaukwu, Umuawulu, Isiagu, Ezinato to the Southeast.

Awka is a fast growing city with a large percentage of migrants, most of which are students. The population of Awka as at 2007 was 176,860 people and a population density of 1,473 persons per square kilometer (km²).



Fig.2 : Map of Anambra showing the study area

2.0 Methodology

2.1 Sampling Framework

The sampling technique employed was the random sampling technique. This technique creates an equal chance of being selected. The technique was employed because of the time constraint and a large population in the study area.

To determine the sample size for the study, the Bourley's formula as reported by Yamane (1973) employed since the total population was known.

$$S = \frac{N}{1 + N(e)^2}$$

Where
 N = population
 e = margin of error (normally 0.05)
 I = theoretical constant
 S = the sample size

Thus, the sample size, S, is;

$$\begin{aligned} &= \frac{176,860}{1 + 176,860(0.05)^2} \\ &= \frac{176,860}{1 + 442.15} \\ &= \frac{176,860}{443.15} = 399. \end{aligned}$$

The various data for this study were collected through questionnaire, and secondary sources such as the National Population Commission. Out of the 399 questionnaires distributed only 300 were fully completed and returned.

2.2 Data Analysis

In analyzing the information collected from the field based on the formulated hypothesis for this research, the Pearson product moment correlation statistical technique was adopted. The Pearson Product Moment Correlation Co-efficient equation is a statistical method that tests the measure of linear association between two quantitative variables. The linear correlation has no units and takes values from -1 to + 1. An English statistician, Karl Pearson, developed this statistical method and it is given mathematically as:

$$r = \frac{\sum xy - (\sum x)(\sum y)}{\sqrt{\left[\frac{\sum x^2 - (\sum x)^2}{n} \right] \left[\frac{\sum y^2 - (\sum y)^2}{n} \right]}}$$

where
 r = correlation co-efficient
 x = independent variable
 y = dependent variable
 n = number of observation
 \sum = summation.

Also data gotten from the questionnaire were presented in tables, pie charts, bar-charts, and in simple percentages.

The data collected are presented below.

3.0 Data Presentation

The information on the affiliations of the respondents are presented in the tables 1-6 below

Table 1: Age Distribution of Respondent

Age	No. of Respondents	Percentage (%)
15-19	20	6.67
20-24	25	8.33
25-29	30	10
30-34	40	13.33
35-39	50	16.67
40-44	50	16.67
45-49	30	10
50-54	25	8.33
55-59	20	6.67
60 and above	10	3.33
Total	300	100

Source: Author's field survey 2010.

From the table 1 above 6.67% of the respondents are between 15-19, 8.33% are between 20-24, 10% are between 25-29, 13.33% between 30-34, 16.67% between 35-39, 16.67% between 40-44, 10% between 45-49, 8.33% between 50-54, 6.67% between 55-59 while 3.33% are 60 and above. This is shown in Fig. 2 below.

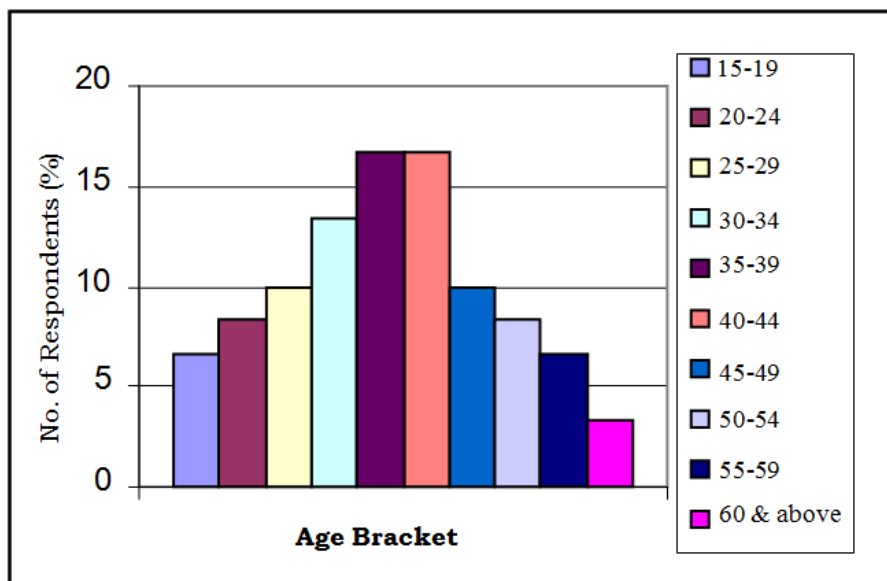


Fig 2: A Bar chart showing age distribution of respondents

Table 2: Marital Status of Respondents

Status	No. of Respondents	Percentage (%)
Married	150	50
Divorced	10	3.33
Separated	20	6.67
Single	70	23.33
Widowed	50	16.67
Total	300	100

Source: Author's field survey 2010.

From table 2, out of 300 respondents 50% were married 23.33% were single, 3.36% were divorced, 6.67% are separated and 16.67% were widowed. Since the percentage of married people is higher than others, there is a huge possibility that the population would be high since they are likely to have children.

Table 3: Level of Education of the Respondent

Level of education	No. of Respondents	Percentage (%)
Informal education	30	10
Primary education	70	23.33
WAEC/GCE holder	150	50
Tertiary education	50	16.67
Total	300	100

Source: Author's field survey 2010.

Table 3 shows that out of 300 respondents 10% had informal education, 23.33% had primary education, 50% were holders of WAEC/GCE/O Level and 16.67% had tertiary education thus the respondents are educated and can give reasonable responses. This is shown below.

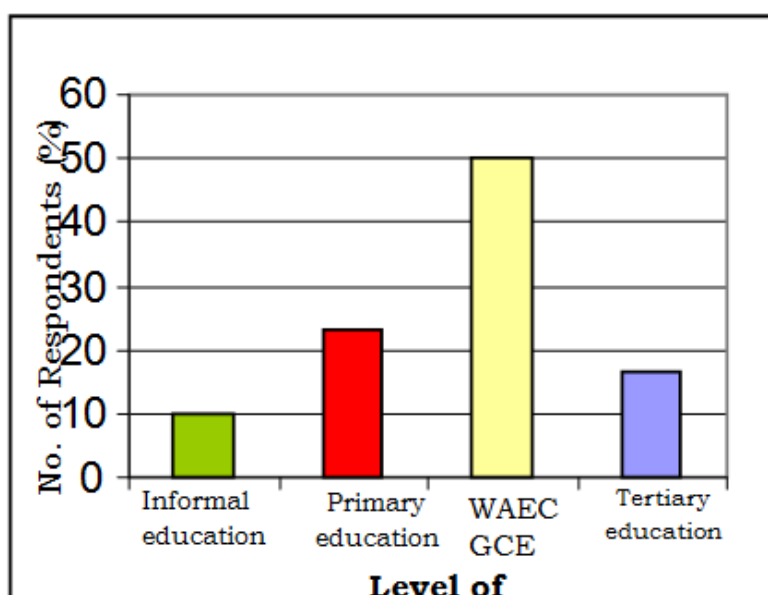


Fig 3: A bar chart showing the level of education of respondents

Table 4: Employment Status of Respondent

Age	No. of Respondents	Percentage (%)
Self employed	95	31.67
Public service	100	33.33
Private organization	80	26.67
Unemployed	25	8.33
Total	300	100

Source: Author's field survey 2010.

From the research 31.67% of the respondents were self employed, 33.33% were in public service, 26.67% were in private organizations and 8.33% were unemployed. This is shown in table 4 above and figure 4 below.

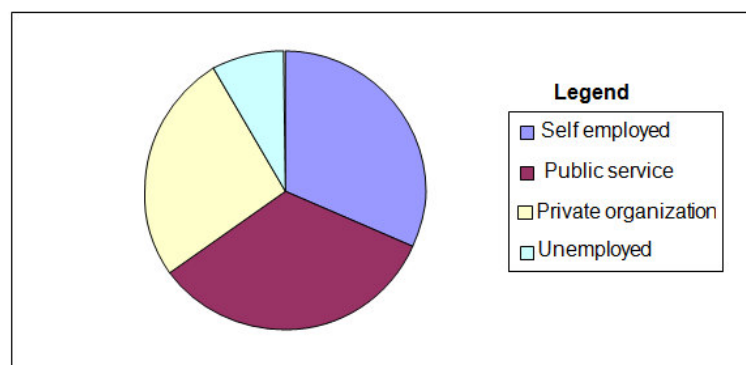


Fig 4: A pie chart showing employment status of respondents.

The following table 5 shows the commitment of the various respondents to agricultural activities

Table 5: Agricultural Production

Crop	No. of Respondents	Percentage (%)
Yam	15	5
Maize	115	38.33
Vegetable	69	23
Palm oil	5	1.67
Cassava	21	7
None	75	25
Total	300	100

Source: Author's field survey 2010.

Table 5 shows that only 5% of the respondents produce yam, 38.33% produce maize, 23% produce vegetables, 1.67% produce palm oil, 7% produce cassava and 25% do not produce any crop.

Table 6: Understanding of Food Security Status

Status	No. of Respondents	Percentage (%)
Domestic food production	66	22
Adequate food in storage	50	16.67
Importing food	25	8.33
Adequate income to purchase food	100	33.33
Eating balanced food	59	19.67
Total	300	100

Source: Author's field survey 2010.

From table 6 above, 22% of the respondents understood food security to be domestic food production, 16.67% understood it to be having adequate food in storage, 8.33% understood it to be importing food, 33.33% understood it to be having adequate income to purchase food, 19.67% understood as eating balanced food.

Table 7: Problem Associated with Food Production

Problem	Respondents	Percentage (%)
Land scarcity	70	23.33
Inadequate capital	60	20
Labour scarcity	30	10
Inadequate storage	25	8.33
Weather (climates)	45	15
Increased population	70	23.33
Total	300	100

Source: Author's field survey 2010.

Table 7 shows that out of the 300 respondents 23.33% believe that the problem of food production is land scarcity, 20% think it is inadequate capital, 10 believe it is labour scarcity, 8.33% believe it is inadequate storage, 15% believe it is weather (climate) and 23.33% believe it is increased population. This is shown in the bar chart below.

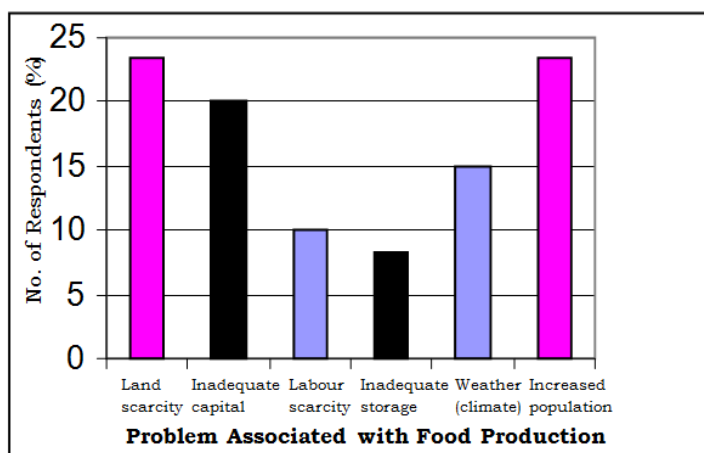


Fig 5: A bar chart showing Problems Associated with Food Production

3.1: Population Growth and Food Production

Table 8: Number of Persons in Household

Frequency	No. of Respondents	Total (Response & Frequency)	Percentage
1	15	15	5
2	10	20	3.33
3	15	45	5
4	25	100	8.33
5	45	225	15
6	65	390	21.67
7	45	315	15
8	58	400	19.33
Total	300	1,780	100

Source: Author's field survey 2010.

Table 8 shows that 5% of the respondents have 1 person in their household, 3.33% have 2, 5% have 3, 8.33% have 4, 15% have 5, 21.67% have 6, 15% have 7, 19.33% have 9 persons and above in their household. The total estimated population progression for the 5 years (2005-2009) is shown in the following tables 9-13:

Table 9: Number of persons in household (2005)

Frequency	No. of Respondents	Total (response x frequency)
1	89	89
2	61	122
3	55	165
4	10	40
5	20	100
6	20	120
7	30	210
8	10	80
9	5	45
Total	300	971

Source: Author's field survey 2010.

Table 10: Number of persons in household (2006)

Frequency	No. of Respondents	Total (response x frequency)
1	85	85
2	60	120
3	51	153
4	20	80
5	25	125
6	25	150
7	14	98
8	10	80
9	10	90
Total	300	981

Source: Author's field survey 2010.

Table 11: Number of persons in household (2007)

Frequency	No. of Respondents	Total (response x frequency)
1	50	50
2	57	114
3	50	150
4	30	120
5	35	175
6	48	288
7	20	140
8	5	40
9	5	45
Total	300	1122

Source: Author's field survey 2010.

Table 12: Number of persons in household (2008)

Frequency	No. of Respondents	Total (response x frequency)
1	48	48
2	57	114
3	48	144
4	25	100
5	30	150
6	40	240
7	15	105
8	20	160
9	17	153
Total	300	1,214

Source: Author's field survey 2010.

Table 13: Number of persons in household (2009)

Frequency	No. of Respondents	Total (response x frequency)
1	30	30
2	15	30
3	20	60
4	30	120
5	50	250
6	70	420
7	30	210
8	45	360
9	10	90
Total	300	1,570

Source: Author's field survey 2010.

4.2.4 Income and Yam Consumption

Table 15: Income Status of Respondents (monthly)

Status	No. of Respondents	Percentage (%)
0-10,000	35	11.67
11,000-20,000	129	43.
21,000-30,000	50	16.67
31,000-40,000	41	13.67
41,000-50,000	24	8
51 and above	21	7
Total	300	100

Source: Author's field survey 2010.

From the table 15 above, it is obvious that a very high number of the respondents constituting 54.67% of the total respondents earn 20,000 Naira and below monthly. 16.6% earn between 21,000-30000 a month, 13.67% earn between 31,000-40,000, 8% earn 40,000-50,000 while only 7% earns 51,000 and above.

Table 16: Understanding of Poverty Status

Status	No. of Respondents	Percentage (%)
Insufficient access to food	90	30
Insufficient income	92	30.67
Living on less than 150 per day	73	24.33
Eating unbalanced food	45	15
Total	300	100

Source: Author's field survey 2010.

From table 16 above 30% of the respondents understand poverty to be having insufficient access to food, 30.67% understand it to be having insufficient income, 24.33% understand it to be living on less than 150 per day while 15% understand it to be eating unbalanced food.

Table 17: Responses to Causes of Food Insecurity/Unavailability.

Cause	No. of Respondents	Percentage (%)
Inadequate food production	32	10.67
Lack of access to employment	45	15
Inadequate income	60	20
Poor quality of labour force	25	8.33
Low-level technology	50	16.67
Lack of access to credit and other productivity resources	40	13.33
Increase population	48	16
Total	300	100

Source: Author's field survey 2010.

Out of 300 respondents 10.67 believe that inadequate food production is the cause of Food Insecurity, 15 % believe it is lack of access to employment, 20% believe it is inadequate income, 8.33% believe it is poor quality of labour force, 16.67% low-level technology, 13.33% lack of access to credit and other productivity resources while 16% believe it is increased population.

4.3 Test of Hypothesis

Hypothesis I

The first hypothesis was formulated as follows:

H₀: There is no significant relationship between population

increase and yam supply in Awka urban.

H₁: There is a significant relationship between population increase and yam supply in Awka urban. To calculate the correlation coefficient, 5 suppliers were interviewed and the mean of their monthly supply for 5 years (2005-2009) were collected presented below.

Table 18: Cumulative supply of each suppliers (in thousand for 5yrs).

Supplier	Cumulative supply				
	2005	2006	2007	2008	2009
1	15	14.5	13.2	11.3	10.6
2	14.6	14.3	12.9	11	9.8
3	14.4	13.4	12.5	11	10
4	14	13.7	11.85	10.6	10.15
5	14.5	13.6	11.9	10.7	9.4
Total	72.50	69.50	62.35	54.60	49.95

Source: Author's field survey 2010.

Table 19: Cumulative Population of Respondent Households (2005-2009)

No of persons in household	2005	2006	2007	2008	2009
1-2	211	205	164	162	60
3-4	205	233	270	244	180
5-6	220	275	463	390	670
7-8	290	178	180	265	570
9 and above	45	90	45	153	90
Total	971	981	1122	1214	1,570

Source: Author's field survey 2010.

Applying the Pearson Product Moment Correlation equation we have:

Calculated 't' value = 4.45

Going into the students 't' test table at 3rd degree of freedom and at 95% level of significance, we have the critical value as 2.35.

't' calculated = 4.45

't' critical = 2.35

Because the calculated 't' value is greater than the critical value, we reject H₀ and H₁ becomes the conclusion, which says:

There is a significant relationship between population increase and yam supply in Awka urban.

Hypothesis II

The second hypothesis was formulated as follows:

H₀: There is no significant relationship between income of consumers and yam consumption in Awka urban.

H₁: There is a significant relationship between income of consumers and yam consumption in Awka urban.

To calculate the correlation coefficient, the respondents were grouped in 10 groups, giving us 30 persons in each group. The mean of each group was calculated and gotten for the income and the amount spent on yam. The mean of each group is shown below.

Table 20: Mean Income and Amount spent on yam for each group

Group	Mean income (in thousand (X))	Mean amount spent on yam (in hundred) (Y)
1	7.5	7
2	9	7
3	7.5	8
4	15	10
5	9	7
6	10	10
7	15	10
8	10	10
9	25	10
10	10	5

Source: Author's field survey 2010.

Applying the Pearson Product Moment Correlation equation we have:

Calculated 't' value = 2.12

Going into the students 't' test table at 3rd degree of freedom and at 95% level of significance, we have the critical value as 1.86.

't' calculated = 2.12

't' critical = 1.86

Because the calculated 't' value is greater than the critical value, we reject H_0 and H_1 becomes the conclusion which says:

There is a significant relationship between income of consumers and yam consumption.

4.4 Discussion of Findings

From the analysis of the data sets collected and analyzed, it show that there is need for lasting solution to reduce the population or there will be a huge damage on the environment. Also the increasing population growth affects productivity of yam. The data sets were tested by testing the hypothesis, the hypothesis negatively formulated were rejected and the alternative accepted.

In hypothesis one, it was shown that there are significant relationship between population increase and yam supply. Therefore the null hypothesis (H_0) which states that the increasing population is not significantly related to yam supply was rejected and the alternative hypothesis accepted.

In hypothesis two, it was proved that there is a relationship between the income of consumers and the amount spent on yam consumption. The null hypothesis was rejected and the alternative hypothesis was accepted.

4.5 Summary of Findings

The study have identified and discussed the impacts of physical, social and economic activities of man on food security. The research hypothesis have been statistically tested and the study therefore, has established that there is a significant impact of mans activities on the people of the study area.

Summary

This research was carried out with the intention to assess yam supply and food security in Awka urban in Anambra State. The research null and alternative hypotheses were formulated and tested statistically using Pearson Product Moment Correlation Coefficient.

Related literature were reviewed to see other people's view about the concept of food security and factors affecting it. Two major theories were used, Malthusian theory and carrying capacity.

Questionnaire were administered to help collect necessary data for proper computation in food security.

5.1 Recommendation

It is important to make some recommendations after careful consideration of the result of the study. We have seen that the increase in population has a great effect on the food security of the area. In order to check population and boost the food supply to ensure food security, the following recommendations will be useful in tackling these problems:

1. Governmental and non-governmental organizations should provide measures to create awareness by providing educational facilities and officials to educate the people on the danger of having too many children.
2. Government should provide family planning services, advice and facilities for the masses to help control population.
3. Government should introduce and encourage urban agriculture which is any form or scale of agricultural activity that happens within the boundaries of the urban environment. This will make meaningful contributions towards household food security, income generation, affordability of food to the poor, increase social status and for nature conservation.
4. Sustainable agriculture, which uses ecological principles to farm, is an integrated system of plant and animal production having a site specific application. Over the long term, sustainable agriculture will:
 - Satisfy the food and fiber needs of the people;
 - Enhance environmental quality and the natural resource base upon which agricultural economy depends;
 - Make the most efficient use of non-renewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls;
 - Sustain the economic viability of farm operations; and
 - Enhance the quality of life who farm and society as a whole.
5. Improved agricultural practices and application of improved and environmentally sound technology should be introduced and encouraged. This will assist in more efficient management and use of agricultural produce.
6. Adequate and efficient storage faculties should be provided for farmer and household in order to ensure food security.
7. Farmers should be provided with irrigation facilities and other productivity resources required to boost agriculture such as fertilizer at subsidized prices.
8. Strategies for the future should be based first and foremost on the conservation and careful management

of land, water, energy and biological resources needed for food production.

None of these measures will ensure adequate food supplies and food security for future generations unless the rapid growth in the human population is curtailed.

5.2 Conclusion

It has been observed through this research work that population growth is a major factor affecting the food security of the study area and even at the household level. Other factors affecting the food security of the study area are climate change and the income of the people.

Agricultural productivity would help improve the food security status of the inhabitants of the area. Proper management and application of improved agricultural practices will go a long way to ensure this.

References

Food and Agricultural Organization (2008). “*Expert Meeting on Global Perspectives on Fuel and Food Security*”: Technical Report. 18-20 February 2008. Rome.

Gross, R., Schoeneberger, Pfeifer H., Joachim and Preuss. (2000). ***The four Dimensions of Food and Nutrition Security: definitions and concepts.***

Nweke, F. I., Ugwu, B.O., Asadu, C.L and Ay, P. (1991). “*Production cost in the yam based cropping system in South-Eastern Nigeria*” *research monograph* (6). Resource and Crop Management, IITA, Ibadan, Nigeria.

Okoli, O.O., Igbokwe, M.C., Ene L.S.O and Nwokoye, J.U. (1982). “Rapid multiplication of yam by the miniseH technique”, ***Research Bulletin (2)***. National Root Crops Research Institute (NRCRI). Umudike, Abia State, Nigeria.

Okigbo, B.N. (1980). “Plants and Food in Igbo Culture” ***Ahiajoku lectures, Ministry of Information and Social Development.*** Government press. Owerri, Imo State, Nigeria,

Orkwor, G.C., Asiedu, R. and Ekanayake, I.J. (1998). *Food Yams: Advances in Research International Institute of Tropical Agriculture (IITA)*, Ibadan and National Root Crops Research Institute, African Book Builders Ltd, Umudike Abia State, Ibadan, Nigeria.

United Nation Development Programme (2004). “*Millenium Development Goals*”. ***Human Development Report 2004***, Oxford University press, New York.

United States Agency for International Development (1992). ***Policy Determination 19: “Definition of Food Security*”**. United States Agency for International Development, Washington D.C.

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