



Constraints to Achieving Household Food Security in North Central Nigeria

Mary O. Agada^{1*} and Edwin M. Igbokwe²

¹*Institute of Food Security, University of Agriculture, P.M.B. 2373 Makurdi, Nigeria.*

²*Department of Agricultural Extension, University of Nigeria, Nsukka, Enugu State, Nigeria.*

Authors' contributions

This work was carried out in collaboration between both Authors. Author MOA designed the study, wrote the protocol, managed the literature searches and wrote the first draft of the manuscript. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JAERI/2015/13758

Editor(s):

(1) Bin Gao, Dept. of Agricultural & Biological Engineering, University of Florida, USA.

Reviewers:

(1) Anonymous, Yaba College of Technology, Lagos, Nigeria.

(2) Anonymous, Federal University of Technology Akure, Nigeria.

Complete Peer review History: <http://www.sciencedomain.org/review-history.php?iid=682&id=37&aid=6880>

Short Research Article

Received 2nd September 2014

Accepted 20th September 2014

Published 6th November 2014

ABSTRACT

This study identified constraints militating against the attainment of household food security among three ethnic groups in North Central Nigeria in 2011. A sample of 340 households was interviewed using structured questionnaires. Factor analysis was used to isolate and name the critical factors influencing the attainment of household food security in the region. Findings revealed that economic, governance, institutional and technological constraints hindered the achievement of household food security in the study area. While the economic factors included climatic change and variability (0.57), shortage of farm labour (0.55), limited access to farm land (0.57); the institutional factors were poor market access (0.56), weak support services (0.48), poor nutrition education (0.48) and poor sanitation (0.44). The governance factors included political problems (0.51), rapid population growth rate (0.43) and low crop yield (0.43) while the technological factors were lack of access to clean water (0.43), inadequacy and lack of access to improved agricultural inputs (0.42) and lack of access to labour saving devices (0.41). Attaining household food security in North Central Nigeria is still a mirage. Therefore, governments at the local and state levels should design and implement short term and long term programmes in agriculture value chain to boost food production and productivity and enhance family income for improved household food security.

*Corresponding author: Email: maryagada59@gmail.com;

Keywords: Constraints; household; food security; North Central Nigeria.

1. INTRODUCTION

The concern for food security is increasing at the global, national, regional and state levels. The World Food Summit target set in 1996 was to half the number of undernourished people by 2015, but the number has been increasing annually by 4 million malnourished people such that in 2010 the number of hungry people in the world was estimated at 925 million. The increase has been due to neglect of agriculture relevant to very poor people by governments and international agencies; the current worldwide economic crisis and the significant increase of food prices [1,2]. The world population was estimated to be 7 billion people in 2011 [3]. Thus, with an estimated 925 million hungry people in the world, 13.1 percent or almost 1 in 7 people are hungry. Nearly the entire undernourished are in developing countries with worst scenarios in Asia (578 million) and sub-Saharan Africa (239 million) [4]. In Nigeria, the percentage of food insecure households was reported to be 18% in 1986 and 40% in 2005 [5]. The food security situation in the country has slightly improved, though the progress is slow. Nigeria had a low level of undernourishment in 2006/2008 as 6 percent or 9.4 million of the total population was undernourished. Both the number and proportion of undernourished decreased from 16.3 million in 1990/1992 to 9.4 million people in 2006/2008 [6]. However, the food available does not ensure food accessibility at the household and national levels; hence a significant proportion of Nigerians is food insecure. Moreover, about two-third of the population lives below the poverty line [7] and are, therefore, most vulnerable to food insecurity. The inability of the poor to have access to needed food can be attributed to low food production and/or lack of sufficient purchasing power to cover their food needs.

Food security exists when all people at all times have physical and economic access to buy, produce, obtain or consume sufficient, safe and nutritious food to meet their dietary needs and food preferences for a healthy and active life [8]. The major elements of food security are food availability, food access, food utilization and protection of access. These dimensions are in turn dependent on agricultural production, food imports and donations, employment opportunities and income earnings, intra-household decision-making and resource allocation, health care utilization and caring practices [9]. These are

combined with the broader factors of physical, policy and social environment [10]. Food insecurity on the other hand connotes a temporary shortfall of adequate food for a proper diet (transitory food insecurity) as well as a long term food shortage called chronic food insecurity.

Research has identified many factors that militate against household food security worldwide. The more serious fundamental root causes in Africa, Nigeria inclusive, have been found to involve a heterogeneous mix of factors. These include chronic poverty, rapid population growth, declining per capita food output, poor infrastructure, lack of access to appropriate technologies, limited access to land due to land tenure systems and inappropriate policies. Others include diseases, inadequate nutritional knowledge, poor water and sanitation, armed conflicts and wars. In addition, over dependence on subsistence farming with limited access to farm inputs and working capital, poor extension services and poor post-harvest processing and storage technologies result in food insecurity. Also there are the problems of limited, or lack of, access to social amenities, over dependence on oil resources as the major foreign exchange earner, poor governance, the impact of trade liberalisation, production of biofuel as well as climate and natural disasters such as floods, drought, erosion and pests. Finally the practice of mono-cropping, lack of access to markets, the impact of petroleum price increase, desertification, socio-cultural factors such as gender inequality, urbanization and food habits are significant factors [11-21]. According to our knowledge, none of these studies was conducted in North Central Nigeria. Hence, the objective of the present study was to identify the factors militating against the achievement of household food security in North Central Nigeria. It is hoped that the findings of this study would assist governments at the local and state levels design and implement policies and programmes that would enhance the income and standard of living of the people and improve household food security.

2. METHODOLOGY

The study was conducted in North Central Nigeria. The region is situated in the southern Guinea savannah agro-ecological zone and it consists of six states, namely Plateau, Nasarawa, Benue, Kogi, Niger and Kwara as well

as the Federal Capital Territory, Abuja [7]. North Central Nigeria covers a land area of about 251,425 square kilometres [22,23]. It has a population of about 20,266,257 inhabitants [24] and is very diverse ethnically. Among the dominant ethnic groups are Tiv, Igala and Eggon.

Although agriculture is the mainstay of the region's economy, it is at a subsistence level. This can be attributed to poor access to modern inputs and credit, poor infrastructure, inadequate access to markets, land and environmental degradation and inadequate research and extension services [25].

The primary data used in this study was obtained from a sample survey of households in three villages conducted in 2011 among the Tiv, Igala and Eggon ethnic groups in Benue, Kogi and Nasarawa States of Nigeria. A multi-stage sampling procedure was adopted for the study. In the first stage a purposive sampling technique was used to select three ethnic groups and one village per ethnic group based on differences in language and culture. In the second stage a random sample of 120 Tiv, 108 Igala and 112 Eggon households respectively were interviewed from each village using a structured questionnaire. Thus, 340 households, out of a total of 851 households residing in the villages were involved in the study.

Factor analysis was used to isolate and name the critical factors influencing the attainment of household food security in North Central Nigeria. The factor loading under each constraint (beta weight) represents a correlation of the variables (constraint areas) to the identified constraint factor and has the same interpretation as any correlation coefficient. However, only attributes with loadings of 0.40 and above (10% overlapping variance) were considered in naming the factors [26].

3. RESULTS AND DISCUSSION

The results of the rotated component matrix indicating the perceived constraints to food security in North Central Nigeria are shown in Table 1. Based on the item loadings of the factor analysis, four critical factors were isolated and named. These were economic constraints (Factor 1), institutional constraints (Factor 2), governance constraints (Factor 3) and technological constraints (Factor 4). The four factors represent the constraints militating against food security in the region.

3.1 Economic Constraints

An assessment of the loadings indicated that economic constraints (Factor 1) included climatic change and variability (0.57), limited access to land (0.57) and shortage of farm labour (0.55). Agriculture is the primary occupation of the population and it is rain-fed. Farmers reported that their food production system was adversely affected by variability in timing and amount of rainfall, frequent outbreaks of crop pests and diseases and heat stresses leading to low income and increases in food shortages. Climate change affects food security through exposing the population to the highest degree of instability in food production [27]. Climate fluctuations could cause drought and floods, the dominant causes of short term fluctuations in food production and this could drastically reduce crop yield [28]. Limited access to land could result in unsustainable practices, including reduction of fallow, that lead to soil and water degradation, land exhaustion and plummeting productivity. The size of land that can be cultivated could be tied to unavailability of affordable labour supply. Therefore, shortage of labour could result in low agricultural productivity. The shortage of farm labour observed in the study area could be attributed to the increasing migration of able-bodied youths from rural to urban areas.

3.2 Institutional Constraints

Institutional constraints (Factor 2) refer to the bottlenecks or obstacles found in an organization or the shortcomings arising from the application of rules which hinder project success. The items that loaded high under institutional constraints are lack of market access (0.56), weak support services (research, extension and finance) (0.48), poor nutrition education (0.48) and poor sanitation (0.44). Lack of access to market means that farmers and communities can neither sell their surplus nor purchase food in times of shortage. This could lead to inconsistent food availability thus contributing to food insecurity. Access to markets could enable rural farmers to produce for the market, but the poor live in isolated villages that can become virtually inaccessible during the rainy seasons. Nigeria's rural road network is the least developed in sub-Saharan Africa [29] and there is no credible commitment by political actors to rectify this. In addition, weak support services have a negative effect on agricultural performance and this could hinder food security. For instance, as a result of poor funding of agricultural research and lack of

private sector involvement in agriculture, improvement in the development of new agricultural technologies, growth of agricultural productivity and the reduction of rural poverty have been slow [30]. Similarly, poor funding of agricultural extension services in Nigeria has slowed the pace of transfer of available technologies to farmers. Furthermore, extension service in Nigeria has become ineffective due to the insufficient number of extension workers who are skilled in training and in the dissemination of agricultural information as well as lack of motivation for the field staff [31]. Greater government funding of agriculture, particularly investment in appropriate research and extension services, could help overcome these constraints.

It is important for poor households to make the optimal use of local foods and to follow healthy eating patterns, thereby promoting food security. Nutrition education helps people to make the best choice of foods for an adequate diet by providing them with information on the nutritional value of foods, food quality and safety, preservation methods, processing and handling, food preparation and eating habits [18]. Nutrition education for women in the study area who are responsible for growing, choosing and preparing food could have an enormous impact on food security. The poor sanitation (0.44) reported by farmers could be attributed to improper disposal of household refuse. Lack of proper waste disposal could lead to poor uptake of nourishment and consequently to ill health. Extension workers should collaborate with public health officers to educate farmers on basic hygiene rules.

3.3 Governance Constraints

Items that loaded high under poor governance (Factor 3) included political problems (0.51), rapid population growth rate (0.43) and low crop yield (0.43). The quality of governance influences the degree of agricultural production and food security. Governance includes the education of women and children, provision of clean water and health care and a stable functioning market system [32], all of which were found to be inadequate in the study area. Governance and politics in Nigeria are characterized by high rates of corruption, collusion and nepotism and this has a negative impact on agriculture, food access and utilization. It was observed that funds allocated to the agriculture sector are most often diverted into the pockets of political office holders

and government officials, leaving insufficient funds for any meaningful impact on agriculture [33]. To worsen the situation, governments in Nigeria give priority to urban areas since that is where the most influential and powerful families and enterprises are usually located. The government often neglects subsistence farmers and the rural areas in general. The more remote and underdeveloped the area, the less likely the government will be to effectively meet its agricultural and food security needs.

The rapid population growth observed in the region may affect the food security status through the impact of overcrowding on reduced per capita land availability and per capita food availability. Rapid population growth is also known to contribute to environmental degradation leading to reduced agricultural productivity. In addition, it can result in poor sanitation and the spread of disease which influences not only labour productivity and incomes, but also nutritional status [34]. Furthermore, low yields may have occurred because of technical constraints that prevent local food producers from increasing productivity or for economic reasons arising from market conditions. For example, farmers may not have access to the technical knowledge and skills required to increase production, the finances required to invest in higher production (e.g. irrigation, fertilizer, machinery, crop-protection products and soil conservation measures) or the crop varieties that maximize yields. After harvest, farmers may not be able to store the produce or transport the produce to consumer markets. Poor governance is one of the major factors hindering the development in agricultural production leading to food insecurity in North Central Nigeria.

3.4 Technological Constraints

Items that loaded high under technological constraints (Factor 4) included: lack of access to clean water (0.43), inadequacy and lack of access to improved agricultural inputs (0.42) and lack of access to labour saving devices (0.41). Although farmers can access water for domestic use within a distance of one kilometre from their homes, the water is not clean, particularly in Tiv and Eggon households where people fetch water from streams and untreated wells. Without access to clean water, optimal uptake of nourishment is likely to be hindered. In addition, farmers reported that they had great difficulty accessing agricultural inputs, especially fertilizer,

agro-chemicals and improved seeds as they sometimes travelled as far as 15-20 kilometres to access small quantities of inputs; particularly fertilizer. This could be attributed to the poorly developed rural input markets in the region. Similar studies in Nigeria also reported that farmers have little or no access to modern inputs and other productive resources [30]. The provision of farm inputs at the right time and at reasonable prices by governments at all levels is critical to crop productivity and food security. The finding on technological constraints concurs with other studies which reported that non-availability of improved modern technologies for agricultural production, that are time and energy saving, is one of the main constraints in agricultural production in Nigeria [35,36]. This finding has implication for the local, state and federal governments to provide farmers with labour saving technologies at subsidized rates in order to reduce the drudgery in farming.

4. CONCLUSION AND RECOMMENDATION

This study revealed that economic, institutional, governance and technological problems hindered the development of agriculture and attainment of household food security in North Central Nigeria. It is recommended that policies that would mitigate these problems be formulated and implemented by the local and state governments through the extension agencies and other relevant government and non-governmental organizations. This would enable the region to provide adequate food for its teeming population and make a significant contribution to the achievement of the Millennium Development Goal of eradicating poverty and hunger in Nigeria by 2015.

ACKNOWLEDGEMENTS

The authors express gratitude to the research assistants who helped in the data collection and the farmers who provided information used in this study.

Table 1. Factor analysis of perceived constraints to food security in North Central Nigeria

Constraints	Factor*			
	1	2	3	4
Climate change and variability	0.566	0.086	-0.023	-0.114
Low crop yields	-0.012	0.132	0.428	-0.050
Shortage of farm labour	0.550	-0.043	-0.132	0.110
Lack of access to labour saving devices	-0.152	0.330	0.118	0.412
Inadequacy and lack of access to improved agricultural inputs (seeds, fertilizer, agro-chemicals and irrigation)	-0.041	0.088	0.223	-0.423
Rapid population growth	0.358	0.016	0.431	-0.301
Limited access to land	0.565	-0.134	-0.141	-0.074
Lack of education and skills	0.370	-0.318	0.050	-0.028
Poverty	0.024	0.083	-0.010	0.393
Weak support services (research, extension and finance)	-0.234	0.483	0.344	-0.167
Religious and ethnic conflicts	-0.014	0.322	0.261	-0.019
High food prices	0.092	-0.293	0.319	0.198
Poor rural infrastructure (roads)	-0.314	0.277	-0.145	-0.384
Political problems (corruption, collusion and nepotism)	0.070	0.013	0.507	0.202
Lack of consistent food supply	-0.124	0.002	0.344	0.079
Poor nutrition education	0.197	0.478	-0.133	-0.104
Poor post-harvest processing and storage technologies	-0.100	0.393	-0.123	0.155
Chronic diseases such as HIV/AIDS	0.319	-0.011	0.156	0.001
Lack of access to clean water	0.312	0.295	0.151	0.430
Poor sanitation	0.301	0.442	-0.151	0.037
Poor health services	0.117	0.082	0.016	-0.337
Food taboos	-0.047	-0.140	0.156	0.266
Poor food habits	-0.006	0.395	0.049	-0.212
Poor health status	0.326	0.364	0.084	0.184

*Factor: 1= Economic constraints; 2= Institutional constraints; 3= Governance constraints; 4= technological constraints

COMPETING INTERESTS

The authors have declared that no competing interests exist.

REFERENCES

1. Food and Agriculture Organization of the United Nations. The state of food insecurity in the world 2009. 2010. Accessed 4 June; 2010. Available:<http://www.fao.org/docrep/013/i1683e/i1683e.pdf>.
2. Food and Agriculture Organization of the United Nations. Monitoring progress towards hunger reduction targets of the World Food Summit (WFS) and the Nigeria Millennium Development Goals (MDGs). Global statistics service, Rome, Italy; 2011b.
3. United States Census Bureau (USCB). World PoPClock Projection. Accessed 4 April; 2012. Available:<http://www.census.gov/population/Popclockworld.htm>. 2012.
4. Hunger Notes. World hunger and poverty facts and statistics. World Hunger Education Service, Washington D.C. Accessed 12 May; 2011. Available: <http://www.worldhunger.org/learn/worldhungerfacts2002.htm>. 2011.
5. Sanusi RA, Badejo CA, Yusuf BO. Measuring household food insecurity in selected local government areas of Lagos and Ibadan, Nigeria. *Pakistan Journal of Nutrition*. 2006;5(1):62-67.
6. Food and Agriculture Organization of the United Nations. The State of Food Insecurity in the World 2011. Accessed 7 April; 2012. Available: <http://www.fao.org/docrep/013/i1683e/i1683e.pdf>. 2011.
7. National Bureau of Statistics. The Nigerian Statistical Fact Sheets on Economic and Social Development, Abuja; 2005.
8. International Red Cross and Red Crescent Societies. How to conduct food security assessment: A step-by-step guide for national societies in Africa, Geneva, Switzerland. 2006;7.
9. Maxwell S, Frankenberg T. Household food security, concepts, indicators and measurements. A technical review 23. UNICEF/IFAD, New York and Rome. Accessed 23 May; 2009. Available: http://www.ifad.org/gender/tools/hfs/hfspub_1992.
10. Hoddinott J, editor. Food security in practice: Method for rural development projects. 2001; 1. Accessed 14 May; 2012. Available:www.ifpri.org/sites/default/files/hoddinott_ev_jan2012.pdf.
11. United States Agency for International Development. Food aid and food security policy paper. Washington DC; 1995.
12. Ching L. Africa, the food crisis and food aid. *Third World Resurgence*, Issue No.212. Accessed 10 July; 2009. Available: www.twinside.org.sg or www.biosafety-infor.net. 2008.
13. Uza DV. Food security policies and programmes in Nigeria. An invited paper presented at the International Summit on Global Food Security, held in Montreal, Canada, September, 24-26; 2008.
14. Oriola EO. A framework for food security and poverty reduction in Nigeria. *European Journal of Social Science*. 2009;8(1):132-139.
15. Akpan EO. Oil resource management and food insecurity in Nigeria. Accessed 2 February; 2010. Available:<http://erd.eui.eu/media/akpan.pdf> . 2009.
16. Ziervogel G, Nyong A, Osman B, Conde C, Cortes S, Downing T. Climate variability and change: Implications for household food security. AIACC Working Paper, No. 20. Accessed 6 August; 2009. Available: www.aiaccproject.org . 2006.
17. Villareal M. Culture, agriculture and rural development: A review from FAO's Population Programme Service. Accessed 23 July; 2008. Available: <http://www.fao.org/> . 2000.
18. Food and Agriculture organization of the United Nations. Agriculture, food and nutrition for Africa. A resource book for teachers of agriculture. Rome; 1997.
19. Donovan C, Massingue J. Illness, death and micronutrients: Adequacy of rural Mozambican household production of micronutrients in the face of HIV/AIDS. *Food and Nutrition Bulletin*. 2007;(28):331-338.
20. International Fund for Agricultural Development. Enabling the rural poor to overcome poverty in Nigeria. Accessed 9 March; 2010. Available: <http://www.ifad.org>. 2009.
21. World Bank. Gender and food security. Accessed 6 March; 2010. Available: <http://siteresources.worldbank.org/>. 2009.

22. Nigeria Annual Abstract of Statistics. Federal Office of Statistics, Lagos, Nigeria; 1996.
23. Nasarawa Agricultural Development Programme (NADP). 2009 On-Farm Adaptive Research (OFAR) Report. 22nd Central Zonal REFILS Workshop held at Taraba State ADP Jalingo; 2010.
24. National Population Commission. The 2006 Population Census Official Gazette (Extraordinary), Lagos. 2007;94(4):52.
25. Department for International Development. DFID rural and urban Development: Case Study-Nigeria: Oxford Policy Management. 2004; 22. Accessed 22 October; 2009. Available:http://www.passlivelihoods.org.uk/site_files%5Creports%5Cproject_id_167%5CNigeria%20Rural%Urban%20Change%20Case%20Study_RU0173.pdf.
26. Comrey AL. The minimum residual method of factor analysis. Psychological Report. 1962;(2):15-18.
27. Bruinsma J, editor. World Agriculture: Toward 2015/2030. A Food and Agriculture Organization Perspective. London: Earthscan; 2003.
28. Allali A, Basalirwa C, Boko M, Dieudonne G, Downing TE, Dube PO. Africa. Climate Change 2001: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press; 2001.
29. Oyewole BA, Oloko SA. Agricultural and food losses in Nigeria-the way out. Accessed 22 October; 2008. Available: <http://www.ivcs.org.uk>. 2006.
30. Dayo P, Nkonya E, Pender J, Oni OA. Constraints to increasing agricultural productivity in Nigeria. IFPRI, Abuja, Nigeria; 2008.
31. Shaib B, Adedipe NO, Aliyu A, Jir MM. Integrated agricultural production in Nigeria: Strategies and mechanisms for food security. Proceedings of the National workshop on Nigeria's position at the World Food Summit. Monograph No. 5, National Agricultural Research Project, Abuja. 1997;15-70.
32. Brown ME, Funk CC, Verdin J, Eilerts G. Ensuring food security (in letters). Science. 2008;320(5876):611-612. DOI:10.1126/science. AAAS publishers, USA. Accessed 6 August 2011. Available: www.sciencemag.org.
33. Egbutah EU. Food security in Nigeria: Concepts and strategies for improvement. The Voice of Teachers. 2009;(1):1-4.
34. Reily F, Mock N, Cogill B, Bailey L, Keneficik E. Food security indicators and framework for use in monitoring and evaluation of food aid programmes. Accessed 14 May; 2009. Available: www.foodaid.org. 1999.
35. International Institute for Tropical Agriculture. Agriculture in Nigeria: Identifying opportunities for increased commercialization and investment, IITA, Ibadan, Nigeria; 2005.
36. Asoegwu SN, Asoegwu AO. An overview of agricultural mechanization and its environmental management in Nigeria. Agricultural Engineering International: The CIGR E-journal. 2007;9(6):6-18.

© 2015 Agada and Igbokwe; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<http://www.sciencedomain.org/review-history.php?iid=682&id=37&aid=6880>