ISSN: 2754-477X

Journal of Food Technology & Nutrition Sciences

SCIENTIFIC Research and Community

Review Article

Open Access

Increasing Food Production Through Fertilizer Voucher Programme (FVP) By Farmers In Taraba State, Nigeria

Salisu Audu Baba

Department of Agricultural Education, School of Undergraduate Studies, College of Education Zing, Taraba State, Nigeria

ABSTRACT

The study examines increasing food production through fertilizer voucher programme (FVP) by farmers in Taraba State, Nigeria. Specifically, the objectives include: ascertain the farming characteristics of the farmers involved in the Fertilizer Voucher Programme; ascertain farmers' level of productivity as a result of Fertilizer Voucher Programme and assess the satisfaction of farmers participating in the Fertilizer Voucher Programme. The population for the study comprised all farmers that participated/benefited in FVP in the Taraba State, numbering 51,098 smallholder farmers. Multistage sampling technique was used to draw the sample size. In stage one (1), two senatorial zones (Central & Northern) was purposively selected for their relative peace and security. In stage two, 6 LGAs (Bali, Gashaka, Gassol and Ardo- kola, Jalingo, Zing,) respectively were randomly selected, 3 LGAs in each of the senatorial zones of the selected zones. From each of the selected LGA, 2 percent of the beneficiaries were proportionally selected and used to collect the primary data for the study. The 2 percentage were selected from each participating LGA to get a sample size of 335 respondents for the analysis of data. Majority (62.8%) of the respondents were full-time farmers while 37.2% were part- time farmers. Majority (81.8%) of the respondents were practicing their agricultural activities as a business with some quantities of outputs sold for other livelihood needs. Majority (99.7%) of respondents cultivate crops such as maize, rice, cassava and guinea-corn which are major crops in the FVP. The years of farming experience among the respondents indicate majority (51.2%) of the respondents had between 11-20 years, 23.8% spent a range of 21-30 years and 21.7% engaged in farming for between 1-10 years. The participants in the livestock industry in the FVP constituted 38.7%, while 37.59% were into mixed farming. However, 36% of them were involved in post-harvest handling/ agro processing activities. Majority (56.8%) of the respondents had farm sizes of between 1-2 hectares, followed by 39.9% of the respondents of the FVP beneficiaries having a size of between 3-4 hectares of cultivable land. The results show that the respondents were satisfied with the followings: prices of fertilizer (M=3.81, SD=0.43), time of arrival of fertilizer (M=3.29, SD=0.69),quality of fertilizers by the suppliers in FVP (M=3.76,SD=0.48), pattern in fertilizer purchase in FVP (M=3.70,SD=0.47), involvement of private supplier (M=3.59, SD=0.55),access to information in the FVP (M=3.69, SD=0.49), transportation of the fertilizer (M=3.49, SD=0.52), role of cooperative associations (M=3.74, SD=0.48) and leadership development among participants (M=3.68,SD=0.49). The study suggested that the number of bags of fertilizer per participating farmer should be increased to between 5 - 8 bags per season as against the 2-4 bags in the FVP. This would make farmers to increase output and income, by implication improve food security of the Nation. The large scale farmers could be offered between 50 – 100 bags based on categories to meet up their fertilizer needs.

***Corresponding author**

Salisu Audu Baba, Department of Agricultural Education, School of Undergraduate Studies, College of Education Zing, Taraba State, Nigeria. E-mail: salisubaba50@gmail.com

Received: May 18, 2022; **Accepted:** May 23, 2022; **Published:** May30, 2022

Keywords: Farmers, Food Production, Fertilizer Voucher Programme (FVP)

Introduction

The importance of agriculture in Nigeria's economy cannot be over emphasized as agriculture employs about 70 percent of Nigeria's population although a large share of its population is engaged in agriculture, Nigeria's agriculture sector represents only about 33 percent of GDP, with primary exports of cocoa and rubber. In 2008, however, agriculture contributed 42 percent of the country's GDP which was a significant increase [1]. Of the total land area, 41 percent of the arable land is under cultivation, 39 percent is utilized for cultivated crops, while another 3 percent supports permanent crops such as fruit- and nut-bearing trees.

The main staple food crops are cassava, maize, millet, sorghum and yams. The main cash crops produced include cocoa, cotton, palm oil and rubber. Most agricultural output comes from smallholder farms (typically less than 2.0 ha), which are characterized as resource poor and practice rain fed agriculture using very low levels of fertilizer or hybrid seeds. The level of fertilizer used per cultivated hectare is 8.4 kg/ha; although it is above the regional average of 7.5 kg/ha, it is considered low relative to other developing regions of the world and is far lower than the 200kg/ha recommended by Food and Agriculture Organization (FAO), Consequently, the potential effect of productivity-enhancing strategies such as increased and efficient use of improved technologies like fertilizer on food security and welfare are large, and understanding the processes through which this can happen is important [2-4].

The federal government subsidized fertilizer procurement and distribution between 1977 and 1996, but not more than 30 percent of the fertilizer reached the farmers [2,3]. In 1997, the sector was abruptly liberalized but without a transition period or support

for the private sector [2,3]. Fertilizer use fell from a peak of 1.2 million metric tonnes (mmt) in 1992 to 56,700 metric tonnes (mt) in 1997. A federal subsidy of 25 percent was reintroduced in 1999 and many Nigerian state governments also added their own subsidies. Because fertilizer was been subsidized to such a degree, there has been no incentive for the private sector to build either a fertilizer distribution system or a retail sales network. Therefore, fertilizer often fails to reach the smallholder farmers who need it the most, as emphasized by Dimelu, [5].

Prior to 2009, the private sector distribution of fertilizer was hindered due to fertilizer being procured and distributed through the Taraba State government. This practice is common throughout Nigeria and has resulted in Nigerian governments being the suppliers' primary customer instead of Nigerian farmers; an unsustainable business strategy [6]. Before 2009 fertilizer distribution and procurement was carried out by Taraba State Government agency; Taraba Agricultural Development Programme (TADP). This practice is common throughout Nigeria and has resulted in governments being the supplier of fertilizer to the Nigerian farmers. But by targeting farmers directly, the FVP in Taraba State now enables farmers deal directly with private-sector fertilizer companies to develop new supply channels throughout the state to reach targeted farmers, delivering higher quality product at a more efficient cost for the government.

In 2010, the FGN announced that it would completely withdraw from fertilizer procurement in support of the expansion of the private agro-dealer network. To facilitate a smooth transition and to ensure that fertilizer reaches the target beneficiaries, the FGN and some state governments began experimenting with a voucher programme in 2009. Essentially, the government policy switched the focus of the programme from subsidizing procurement to supporting farmers to be able to purchase fertilizer. As this was a new policy. Government initially introduced the programme as a pilot voucher programme in two states, Kano and Taraba in 2009/2010.

Problem Statement

Food production per capita in Africa has grown too slowly, well behind rates seen in Asia and Latin America. This has resulted in rising imports of cereals and other staples, and more people who are hungry and undernourished. Yields of staples per hectare have barely risen at all in the region; largely because farmers have not applied manufactured fertilizer in sufficient amounts to take advantage of improved varieties; Farmers have not done so because inputs have been too costly and they have been too poor, with little or no access to credit; Hence, in order to resolve the impasse it is necessary to subsidize the costs of inputs thereby creating a virtuous circle of higher yields, higher incomes, more food and less hunger and poverty [7].

The Nigerian government fertilizer subsidy programmes has been characterized by high level of policy inconsistencies, ambiguities and instabilities that have led to arguments regarding its basis, application, impacts and sustainability [8]. In the 1970's and early 1980's, a majority of African countries subsidized and sold fertilizer through state-owned enterprises. These programmes were roundly criticized for being costly, inefficient, overwhelmingly beneficial to large farmers, and detrimental to the private sector [9]. The FGN became producer, procurer, and distributor of fertilizer. Input policies fluctuated significantly with large swings in the subsidy rates [10].

The effects have been to stunt the growth of the private fertilizer sector and reduce the amount of fertilizer that would have been used by the farmers. The policy of procurement and subsidization of a limited quantity of fertilizer targeted to poor and rural farmers have not had the intended results. The policy has discouraged the private sector and the targeted farmers have not been the beneficiary of the subsidy. When compared with a free market scenario, Nigeria has lost agricultural production, income, and farm labor income, as well as, employment in both the agricultural and fertilizer sectors, an economic multiplier effects that would have extended throughout the economy [11].

The agricultural sector as it is now is weak, despite the contribution to the gross domestic product (GDP), which has averaged 41 percent in the years 2001-2009. Studies have shown that the recorded GDP is not induced by productivity and efficiency gains, but rather by increase in hectares under cultivation. The inefficient production system is majorly characterized by poor input usage (Nigerian Vision 20-20-20 Report). In their study on the federal and state fertilizer subsidy programmes in Nigeria further explained that subsidized fertilizer is not available in time. Officials working in the state agricultural ministries unanimously agreed that fertilizer under the Federal Market Stabilization Programme (FMSP) constantly arrived late [12]. Farmers, both those in small farmers associations and those who are not, also unanimously agreed that subsidized fertilizer arrives late. Agricultural Development Programme (ADP) officials and private agricultural input dealers also share the view that subsidized fertilizer was typically available well past the ideal fertilizer application time [8].

The major constraint has been the operation of the dual markets system which promotes parallel sales of subsidized and free markets fertilizers. The contradictory signals on Nigeria fertilizer policy and programmes underscore the need to assess the utilization of fertilizer voucher programme (FVP) with the aim of coming up with recommendation that could inform a better policy option to realize the potential benefits of fertilizer use in Nigeria's agriculture. Consequently, this study seeks to use the fertilizer voucher scheme in Taraba State to explore whether voucher system of distributing fertilizer through farmer groups can increase farmers' access to agricultural inputs and consequently improve agricultural outputs. Some pertinent questions that seek to be answered by this study include: What is the level of satisfaction of farmers who participated in the FVP in Taraba state? Does the FVP subsidy programme increase availability of fertilizer to poor farmers? Does the FVP and the subsequent utilization of fertilizer increase the farmers' output? Are there improvements in the farmers' characteristics who participated in FVP?

Objectives of the Study

The main objective of the study is to assess increase in food production through fertilizer voucher programme (FVP) by farmers in Taraba State, Nigeria. Specifically, the study sort to:

1. ascertain the farming characteristics of the farmers involved in the Fertilizer Voucher Programme (FVP) on number of fertilizer;
2. ascertain farmers' level of productivity as a result of Fertilizer Voucher Programme
3. assess the satisfaction of farmers participating in the Fertilizer Voucher Programme

The Study Area

The study was conducted in Taraba State, Nigeria. The State has sixteen (16) Local Government Areas with Jalingo being the State

capital. The state has an estimated population of 2 million people according to the 2006 population census, the state is located on $6^0$30' and $9^0$36' North and longitude $9^0$10' and $11^0$50' East. Taraba state shares common boundaries with six (6) states in Nigeria and Cameroun republic. It is accessible from Adamawa State (North-East), Bauchi and Gombe State (North), Plateau (west) and Benue and Nassarawa States (South-West) [13].

Tropical climate is prevalent in the state. The dry season is from November to March and rainy season is from April to October. Average rainfall is 1350mm. The temperature varies from place to place with an average of 35°C depending on the season. The vegetation ranges from tall grasses and forest in the Southern parts to short grasses and shrubs in Northern parts of the state. Agriculture is the bedrock of the economy, over 80 percent of its population engages in agriculture or farming related activities. The state is endowed with fertile land, excellent climate conditions and immense agro-based raw materials.

Population and Sampling Procedure

The population for the study comprised all farmers that participated/benefited in FVP in the Taraba State, numbering 51,098 smallholder farmers (TFVP, 2011). Multistage sampling technique will be used to draw the sample size. In stage one (1), two senatorial zones (Central & Northern) will be purposively selected for their relative peace and security. In stage two, 6 LGAs (Bali, Gashaka, Gassol and Ardo- kola, Jalingo, Zing,) respectively will be randomly selected, 3 LGAs in each of the senatorial zones of the selected zones. From each of the selected LGA, 2 percent of the beneficiaries will be proportionally selected and used to collect the primary data for the study. The 2 percentage will be selected from each participating LGA to get a sample size of 335 respondents; reasonable for handling and managing for the analysis of data.

Table 1: Sampling Procedure for the Study

LGA Total No. of Farmers	% Proportion of Farmers	2 % of Selected Farmers
Bali * (2,620)	2	52
Gashaka (1,615)	2	32
Gassol (2, 602)	2	52 Central Zone
Ardo kola (4,144)	2	83
Jalingo (2, 697)	2	53
Zing (3, 211)	2	64 Northern Zone
Total (16889)	(12)	(335)

Source: Taraba Fertilizer Voucher Programme.
*Values bolded & bracketed are totals**.**

Results and Discussion

Farming Characteristics of the Respondents in the FVP

Entries in Table 2 explain some farming characteristics of the respondents which include: type of farming and level of farming practiced by the respondents, main areas of farming, farming experience for crops respondents and livestock involvement of the respondents.

Types of Farmers and Level of Farming Practised By the Respondents

Table 2 shows that the majority (62.8%) of the respondents were full-time farmers while 37.2% were part- time farmers. A full-time farmer in this context means a farmer who engages all his economic activities in the field of agriculture with no other sources of income, while the part- time farmer does other economic activities for a living. Majority (81.8%) of the respondents were practicing their agricultural activities as a business with some quantities of outputs sold for other livelihood needs. Only 18.2% of the respondents were engaged in agricultural production at the subsistence level. In the contrary, subsistence agriculture is seen as the inherited and dominant occupation employing about 70% of Nigerians [14].

According to smallholder farmers in developing countries play a key role in meeting the future food demands of a growing and increasingly rich and urbanized population? For smallholder farmers with profit potential, their ability to be successful is hampered by such challenges as shortage of fertilizers, improved seeds, climate change, price shocks, limited financing options (credit facilities), and inad¬equate access to healthy and nutritious food. By overcoming these challenges, smallholders can move from subsistence to commercially oriented agricultural systems, increase their profits, and operate at an efficient scale thereby helping to do their part in feeding the world's hungry, increasing family income and the attainment of food security [15].

Size of Farm

Results in Table 2 showed that the majority (56.8%) of the respondents had farm sizes of between 1-2 hectares, followed by 39.9% of the respondents of the FVP beneficiaries having a size of between 3-4 hectares of cultivable land. Also, 2.7% had land size of between 5-6 hactares and only 0.9% of the FVP beneficiaries had above 6 hactares of land. The calculated mean (M) farm size was 2.50 (SD=1.77) hactares which implies that the majority (57%) of the FVP respondents were small holder farmers. The SD value indicates that, there was clustering of class interval values of the farm size of the farmers around the mean of 2.50 hactares of the 336 respondents in the study. The small farm holdings by the respondents is confirmed by the recent report of the Food and Agriculture Organisation of the United Nations (UN)which stated that small farms that rely mainly on family labour are the backbone of agricultural production in developing countries. Also, according to the Food and Agriculture Organisation four-fifths of developing world's food is a product of small sized farms. Small and family- run farms are also home to the majority of people living in absolute poverty and half of the world's undernourished people (International food Policy Research Institute) [16-18].

Main Areas of Farming

Results in Table 2 indicate that a majority (99.7%) of respondents cultivate crops such as maize, rice, cassava and guinea-corn which are major crops in the FVP. The participants in the livestock industry in the FVP constituted 38.7%, while 37.59% were into mixed farming. However, 36% of them were involved in post-harvest handling/agro processing activities.

Farming Experience for Crops Respondents

Table 2 shows the years of farming experience among the respondents. The majority (51.2%) of the respondents had between 11-20 years, 23.8% spent a range of 21-30 years and 21.7% engaged in farming for between 1-10 years. However, 1.5% and 1.8% were practicing farming for 31-40 and 41-50 years. The result indicated a mean of 17.4 years (SD=7.2) of farming experience among the FVP beneficiaries. The SD value of farming experience indicates spread of the mean of 17.4 years because the SD is low with a difference of 10.2 years among the beneficiaries of FVP [20]. Reported that 51.8% of farmers had between the ages ranges

of 19-23 years of farming experience followed by 37% with the range of between 13-18 years.

Respondents in the Livestock Industry

Table 2 shows that the livestock involvements of the respondents were as follows: Poultry (54.6%), Sheep (70.8%), Goat (100%) and Cattle 60%. This implies that 100% of the livestock respondents reared goats. This could be because some of the parts of the study area are naturally hilly areas and goats are more resistant to the drier regions than sheep.

Table 2: Farming Characteristics of the Respondents in the FVP

Characteristics	Percentage (%)	Mean (S.D.)
Type of farmers		
Full time	62.8	
Part time	37.2	
Farm size(ha)		
1-2	56.8	
3-4	39.9 2.7	
5-6	0.9	
Above 6		2.5 (1.77)*
Main areas of farming focus		
Crop	99.7	
Livestock/Fisheries/Poultry	38.7	
Mixed farming	37.5	
Post-harvest handling/agro processing	36.0	
Farming Experience for crops (n=336)		
1 - 10	21.73	
11 – 20	51.19	
21 – 30	23.8 1.49	17.35 (7.20)
31 – 40	1.79	
41 – 50		
Livestock involvement (n=130)*		**Mean of herds**
Poultry	54.6	33.2
Sheep	70.8	11.3
Goat	100.0	14.4
Cattle	60.0	11.9
Farming business level (N=336)		
Subsistence	18.2	
Commercial	81.8	

Source: Survey Data, *Multiple responses.

Crop Output Before and During FVP Implementation among the Respondents

Entries in Table 3 reveal a significant difference in the output of the respondents before and during the implementation of FVP in the study area. During participation in FVP the respondents had an average of 359 bags (50kg) of main crops output of maize, rice, sorghum and cassava (t- value = 13.14; P= 0.00) as against average of 196 bags (50kg) before participation in the FVP of the main crops. The result shows that there was significant influence of fertilizer obtained in the FVP with a margin difference of 196 bags between “the before” and “the during” participation in the programme, thereby improving the income generation from the sales of additional bags (50kg) during the FVP’s implementation and achieving food security in Nigeria. In their evaluation of various technological and institutional interventions to raise agricultural productivity and improve food security. Reported that, farmers’ main reason for the use of fertilizers was to increase crop yields, in fact, 97% of the users of fertilizers opined that their major purpose was to add to their quantity of outputs or total crop yields.

Table 3: Mean Differences of Crop Output During and Before FVP Implementation among the Respondents

Quantity of Fertilizer Allotted in the 4 years (Kg/Bag)					**t-value P-value**
2009	2010	2011	2012	Total	
4.00	4.00	4.00	4.00	16.00	
Output of during the 4 years of Participation in Fertilizer Voucher Programme					
2009	2010	2011	2012	Mean	13.135 0.00
91.84524	88.35714	90.74405	93.85714	359.1639	
Output in the 4 years before Participation in Fertilizer Voucher Programme					
2005	2006	2007	2008	Mean	
50.76488	50.0506	50.00893	53.04762	196.2709	

Source: Survey Data.

Quantity of Fertilizer Allotted to Farmers across the Years of FVP Implementation

Despite Nigeria's rich agricultural resource endowment, however, the agricultural sector has been growing at a very low rate. Less than 50% of the Country's cultivable agricultural land are under cultivation. Even then, smallholder and traditional farmers are constrained by many problems. Agriculture remains the dominant sector in the rural areas of Nigeria. It provides employment for about 60% of the workforce. The diversity of climatic conditions, the richness of soil types and water sources, and the high population density provides great potentials for a crop, animal, fish, and tree production [18].

Table 4 shows that there is no significant difference in the number of fertilizer allocation among the farmers in the 4 years of the implementation of FVP. Each respondent was entitled to an average 4bags of fertilizers in each year of the implementation of the programme with no presentation by proxy or swapping voucher permits/cards among the beneficiaries or non-registered farmers. This because the method of allotment to beneficiaries was strictly an issue of policy in the FVP (F - value = 0.000; P - value = 0.000).

Table 4: Mean Differences in the Quantity of Fertilizer Allotted To Farmers across the Years in FVP

Year	**Mean**	**P-Value**
2009	4.000	0.998
2010	4.000	
2011	4.000	
2012	4.000	
Total	16.000	

Source: Survey Data.

Respondents' Satisfaction with FVP Implementation

Table 5 shows the level of satisfaction of the respondents in the FVP for the years under study. The results show that the respondents were satisfied with the followings: prices of fertilizer (M=3.81, SD=0.43), time of arrival of fertilizer (M=3.29, SD=0.69),quality of fertilizers by the suppliers in FVP (M=3.76,SD=0.48), pattern in fertilizer purchase in FVP (M=3.70,SD=0.47), involvement of private supplier (M=3.59, SD=0.55),access to information in the FVP (M=3.69, SD=0.49), transportation of the fertilizer (M=3.49, SD=0.52), role of cooperative associations (M=3.74, SD=0.48) and leadership development among participants (M=3.68,SD=0.49). Other areas of satisfaction identified by the respondents include: redeeming of vouchers (M=3.52, SD=0.55) and record keeping activities in FVP (M=3.31, SD= 0.58). Only credit facilities to participants (M=2.38, SD=0.64) was perceived as not satisfied by the respondents.

Emphasizing on the level of success of fertilizer subsidies in Africa highlighted that targeting poorer households in FVP led to the high level of satisfaction with programme's implementation not only in Nigeria, but in other African countries (Malawi, Zambia, and Kenya) where similar Fertilizer Programmes were implemented. Some of the respondents buttressed their satisfaction with FVP in the following quotations: "For the first time I get my seeds and fertilizers fast without any political interference", and "This is the first time that we received sudsidized NPK ever". Smallholder Farmer representing Gembu, Sardauna LGA, Taraba State, Nigeria [19].

Table 5: Distribution of Respondents' Satisfaction of FVP Implementation

Variables	Mean	Std. Deviation
Price of fertilizer	3.81*	0.43
Time of arrival of fertilizer	3.29*	0.69
Quality of fertilizer by the suppliers	3.76*	0.48
Patterns in fertilizer purchases	3.70*	0.47
Involvement of private supplier	3.59*	0.55
Access to information in the FVP	3.69*	0.49
Transportation of the commodity/fertilizer	3.49*	0.52
Record keeping activities in FVP	3.31*	0.58
Role of cooperative associations	3.74*	0.48
Credit facilities for participants	2.38	0.64
Leadership development among participants	3.68*	0.49
Redemption of vouchers	3.52*	0.55

Source: Survey Data.

Conclusion

It was evident that smallholder farmers who participated in FVP implementation had increases in their yields during the FVP periods (2009-2012) than the before periods (2005-2008), therefore rated the FVP high and a successful programme that needed to be sustained by both the states and federal governments. Furthermore, if the programme of FVP is sustained by the levels of governments, there is the likelihood that the dream of transforming agriculture into a business may be achieved, especially with the increased participation of the private sector in the supply of farm inputs; fertilizers in particular. Majority of the respondents possessed and utilized the Global System of Mobile (GSM)/cell phone which is vital component of the FVP implementation as a communication channel between farmers and agro- dealers who supply the required fertilizers to the farmers at a more appropriate period to avoid late planting, which in turn will increase production among farmers. Hence, improving food security in the State and Nigeria as a whole [21-27].

Recommendations

Based on the findings of the study, the following recommendations were offered:

1. The number of bags of fertilizer per participating farmer should be increased to between 5 - 8 bags per season as against the 2-4 bags in the FVP. This would make farmers to increase output and income, by implication improve food security of the Nation. The large scale farmers could be offered between 50 – 100 bags based on categories to meet up their fertilizer needs.
2. All fertilizers manufactured, imported, or sold in Nigeria must be registered, packed, and labeled in accordance with the requirements of international (IFDC) standards. All dealers and their premises used for fertilizer activities; procurement, distribution, sales and storage must be registered. The fertilizer dealers must have a minimum level of knowledge concerning the products in which they deal in.

References

1. Banful AB, Nkonya E, Oboh V (2009) Constraints to Fertilizer Use in Nigeria: Perspectives and Insights from the Agricultural Extension Service, NSSP Brief No. 6, IFPRI, Adobe Acrobat Document 1-5.
2. Liverpool-Tasie SL O, Auchan AA, Banful AB (2010) An Assessment of Fertilizer Quality Regulation in Nigeria, Nigeria Strategy Support Program (NSSP) Report 9, Adobe Acrobat Document.
3. Liverpool-Tasie S, Banful AB, Olaniyan B (2010) Assessment of the 2009 fertilizer voucher programme in Kano and Taraba, Nigeria, Nigeria Strategy Support Program (NSSP) Working Paper No. 0017. International Food Policy Research Institute, Washington D.C., USA. Available at: http://www.ifpri.org/publication/assessment-2009-fertilizer-voucher-program-kano-and-taraba-nigeria.
4. Liverpool-Tasie LS (2012) Farmer Groups, Input Access, and Intra group Dynamics: A Case Study of Targeted Subsidies in Nigeria, International Food Policy Research Institute, IFPRI Discussion Paper 01197, www.ifpri.org.IFPRI-Abuja, Nigeria.
5. Dimelu MU, Ogonna SE, Enwelu IA (2012) Conservation Practices among Arable Crop Farmers in Enugu- North Agricultural Zone, Nigeria: Implications for Climate Conference proceedings of Agricultural Extension Society of Nigeria (AESON) 140 -151.
6. Taraba State Fertilizer Voucher Programme (2011) USAID–IFDC Handbook, State Ministry of Agricultural and Rural Development, Jalingo, Taraba State, Nigeria 1-4.
7. Bunde AO, Kibet K, Daphen Otieno Ojala, Mugo SW, Chomboi KC (2014) Impact of Fertilizer Input Subsidy on Maize Production in Nandi North District, Kenya, International Journal of Sciences: Basic and Applied Research (IJSBAR), http://gssrr.org/index.php?journal=JournalOfBasicAndApplied 15: 520-540.
8. Charles JA (2011) Towards Improved Fertilizer Subsidy Program in Nigeria: Drawing Lessons from Promising Practices in the Sub Saharan Africa Report Prepared for the Visiting Fellowship for African Policy Officials.
9. Carter MR, Laajaj R, Yang D (2013) the Impact of Voucher Coupons on the Uptake of Fertilizer and Improved Seeds: Evidence from a Randomized Trial in Mozambique, Forthcoming, American Journal of Agricultural Economics Papers and Proceedings 1: 4-16.
10. Gugerty MK, Gockel R (2009) Political Economy of Fertilizer in Nigeria, prepared for the Agricultural Policy and Statistics Team of the Bill & Melinda Gates Foundation, Evans School of Public Appears, University of Washington, U.S.A.
11. Nagy JG, Edun O (2002) Assessment of Nigerian Government

Fertilizer Policy and Suggested Alternative Market –Friendly Policies, Report to IFDC.

12. Banful AB, Olayide O (2010) Perspectives of Selected Stakeholder Groups in Nigeria on the Federal and State Fertilizer Subsidy Programmes, IFPRI-Abuja, NSSP Report 8, Adobe Acrobat Document 1-14.
13. Bonjoru FH (2013) Manpower and Institutional Constraints in the Administration of Fadama III Project in Taraba State, Nigeria, Unpublished Ph.D. Dissertation, submitted to Department of agricultural Extension, Faculty of Agriculture, University of Nigeria, Nsukka, Enugu State, Nigeria.
14. Aremu YS (2014) Role of Agriculture in Economic Growth and Development: Nigeria Perspective, Online At Http://Mpra.Ub.Uni-Muenchen.De/55536/, Mpra Paper No. 55536, Posted 28: 5-8.
15. Fan S, Brzeska J, Keyzer M, Halsema A (2013) From Subsistence to Profit, Transforming Smallholder Farms, International Food Policy Research Institute, A member of the CGIAR consortium.
16. FAO (2011) Current World Fertilizer Trends and Outlook to 2015, Food and Agriculture Organization (FAO) of the United Nations, Rome, Adobe Acrobat Document.
17. FAO (2012) Current world fertilizer trends and outlook to 2016, Food and Agriculture Organization of the United Nations, Rome. (a) Federal Ministry of Agriculture and Rural Development (FMARD) (2016a). Growth Enhancement Support Scheme (GESS), GESS – View Current GES Live Statistics Dashboard, (FMARD), Abuja, Nigeria. (b) Federal Ministry of Agriculture & Rural Development (FMARD) (2016b).The Agriculture Promotion Policy(APP) (2016-2020), Building on the Successes of the ATA, Closing Key Gaps, Policy and Strategy Document, (FMARD), Abuja, Nigeria 1-59.
18. Hamza S (2018) Profitability of Soybean Production by Small Holder Farmers in Nigeria: Impact of an Agricultural Programme Zamfara State, Nigeria, International Journal of Agricultural Science and Research (IJASR), TJPRC Pvt. Ltd 8: 59-70.
19. Minde I, Jayne TS, Ariga J, Govereh J, Crawford E (2008) Fertilizer Subsidies and Sustainable Agricultural Growth in Africa: Current Issues and Empirical Evidence from Malawi, Zambia, and Kenya, IFDC workshop on "Strengthening Trade in Agricultural Inputs in Africa: Issues and Options" Taj Pamodzi Hotel, Lusaka, Zambia 19-37.
20. Egwu EW (2014) Constraints to climate change mitigation and adoption among rice farmers in Ebonyi State, Nigeria, Journal of Agricultural Economics, Extension and Rural Development: Spring Journals 2: 189-194.
21. Fact Sheet, Growth Enhancement Support (GES), Paper Voucher in Practice, Process Manual (2012). How to Redeem and Purchase (GES) Fertilizer, (USAID), (FMARD), Taraba State IFDC 1-2.
22. Final Report of: The Agricultural Extension Transformation Agenda (FRAETA, Undated), Retrieved as Modified: 16/02/2013.
23. International Fertilizer Development Center (IFDC) (2013a) Overview creating solutions for sustainable agricultural development, website at www.ifdc.org 1-4.
24. International Fertilizer Development Centre (IFDC) (2013b). Feed the future type: MHTML Document, Date of Retrieved, 14/5/2013 23: 22.
25. Liverpool-Tasie LO (2012b) Did Using Input Vouchers Improve the Distribution of Subsidized Fertilizer in Nigeria? The Case of Kano and Taraba States, Development Strategy and Governance Division, IFPRI Discussion Paper 01231, Adobe Acrobat Document, www.ifpri.org.
26. Liverpool-Tasie S (2012c) Targeted Subsidies and Private Market Participation: An Assessment of Fertilizer Demand in Nigeria. IFPRI Discussion Paper 01194. International Food Policy Research Institute, Washington, D.C., USA. Available at: http://www.ifpri.org/sites/default/files/publications/ifpridp01194.pdf.