

Analysis of Spatial Variation in Agricultural Development Programmes In Kano State, Nigeria

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Abstract

Agriculture is an important sector in the economic development and poverty alleviation drive of many countries. The importance of this sector is more pronounced in developing countries such as Nigeria. The persistent failure of agricultural development programmes in Nigeria has demonstrated the weakness of the policies coupled with inability of the successive administrations to resolve the fundamental problems of development. The major goal of this study is to analyse spatial variation in agricultural development programmes in Kano State. Questionnaire survey and documented materials constituted major sources of data. Twelve Local Government Areas were purposely selected across the three Senatorial districts. A total of 384 respondents were randomly selected in the administration of the questionnaire. Descriptive statistics was used to summarize the data. Also, inferential statistics such as the location quotient (LQ) was employed to measure level of variations in agricultural development programmes. The location quotient result is categorized into upper, middle and bottom based on the performance of each Local Government Area in agricultural development programmes. The upper group include Tofa(0.80), Madobi(1.10), Warawa(1.20) and Kura (1.30) While the middle group include Gwarzo(1.34), Gaya (1.39), Danbatta(1.40) and Tsanyawa(1.45). The bottom group include Minjibir (1.51), Doguwa (1.71), Rano (2.20) and Rogo (2.20). On the basis of the findings, the study recommends that there is need for the benefits from agricultural development programmes to spread across the entire State. In order to promote a balanced development. Also, government should create enabling environment where the farmers at the grassroots will be given opportunity to participate in agricultural development programmes within their locality.

Key Words: Spatial Variation, Sustainable Agriculture Development Programmes

INTRODUCTION

In most African countries, agriculture supports the survival and well-being of up to 70% of the population. Thus, for many, their livelihoods are directly affected by environmental changes, both sudden and gradual, which impact on agricultural productivity (Cleveland, 2007).

However, with the discovery of crude oil in Nigeria and the subsequent oil boom in the 1970s, less attention was given to agricultural sector which hitherto had been the major foreign exchange earner for the country. To meet up with the crisis, both the federal and state governments formulated several policies and embarked on a variety of agricultural programmes aimed at improving the capacity of the agricultural sector (Okereke, 2000).

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Manyong *et al* (2005) highlighted some of the national agricultural development schemes and programmes in the country namely, Farm Settlement Schemes, River Basin Development Authorities (RBDAs), Operation Feed the Nation (OFN), Green Revolution Scheme (GRS), Agricultural Development Projects (ADPs) that were launched in a collaborative effort between the Federal Government of Nigeria and the United Nations that radiated to all States in Nigeria.

This type of agricultural development programme is exemplified by the Kano River Project in Kadawa which was built primarily for the production of wheat in the dry season (Mortimore, 2003). Furthermore, large scale irrigation projects have recorded poor performance (Adams, 1991; Harris, 1991).

The Kano State Fadama III operation supported the financing and implementation of five main components designed to transfer financial and technical resources to the beneficiary groups. The programme has faced with the problem of poor sensitization of farmers on the programme (KASC, 2015). Despite all these agricultural development programmes and schemes put in place at various times in the history of Kano State, agricultural potentials are not fully developed. It is therefore, imperative to analyse spatial variation of agricultural development programmes in Kano State, Nigeria.

The overall aim of this study is to analyse the spatial variation of agricultural development programmes in Kano State. However, the specific objectives are to: (i) analyze the spatial variation in the distribution of agricultural development programmes in Kano State (ii) examine the level of spatial balance in Agricultural development programmes in the study area (iii) produce pattern of agricultural development programmes in Kano State.

REVIEW OF RECENT STUDIES IN AGRICULTURAL DEVELOPMENT

It is imperative to examine some of the recent studies in agricultural development. Igwe (2015) examined spatial pattern of Agricultural production in Nigeria using the principles of location relation to market, the principle of comparative advantage and Von Thune's classical theory on land use. The study revealed that agricultural production of cereals and pulses are determined by natural factors and nearness to market.

Adefila (2014) investigated pattern of Agricultural development in Southern parts of Katsina State, Nigeria. The study revealed that, the study area experienced differing levels of deprivation in agricultural development.

Iwuchukwu and Igbokwe (2012) examined lessons from agricultural policies and programmes in Nigeria. The paper revealed that various stakeholders including farmers/rural people should be involved in planning and execution of agricultural policies and programmes.

MATERIALS AND METHODS

Indicators of Agricultural Development in Kano State

The study has carefully selected a number of Agricultural development indicators required for meaningful results. The following indicators have been considered and they include: (i) access to land area (ii) Cropping intensity per annum (iii) Chemical fertilizer consumption (bags) (iv) Number of Agricultural labourers/hired (v) Financial institutions/commercial banks (vii) Access to road (viii) Modern equipment adopted on farms (viii) Number of

research extension workers (ix) Number of livestock (cow/goat) (x) Number of poultry (chickens)

Sources of Data

The study employed both primary and secondary sources of data. Secondary sources included documented materials from official gazettes, annual report, research report, journals, published articles and on-line materials. The primary sources of data were collected through administration of questionnaire as a major research instrument for the study. Structured questionnaire was used to collect relevant data from the respondents in the twelve Local Government Areas in Kano state.

Sample Size and Sampling Procedure

Kano State has a projected population of 12,150,811 in (2017). However, the population figure for the twelve purposively selected was 2,614,755. The Sampling Table by Krejcie and Morgan (1972) was used to determine sample size of 384. The sample size for each of the twelve LGAs vary with the population size thus, Danbatta 39, Doguwa 29, Gaya 39, Gwarzo 34, Kura 28, Madobi 27, Minjibir 41, Rano 29, Rogo 42, Tofa 20, Tsanyawa 30 and Warawa 26. Considering the sampling techniques, a multi-stage sampling technique was adopted. First, a purposive sampling was used to select the twelve Local Government Areas that are part of the study. Second, three wards were randomly selected in each Local Government Area, making a total of total of (36) wards for the study. Third the households were randomly selected. It was the head of the household or the oldest person in the household that supplied the data for the study.

Techniques of Data Analysis

Location Quotient (LQ) approach was adopted to measure the level of variation in agricultural development programmes based on the indicators of agricultural development outlined above. The location quotient is expressed as Beyene et al, (2005) $LQ =$

$$\frac{S_i/S}{N_i/N} \dots\dots\dots \text{Eqn. (1)}$$

Where:-
LQ = location quotient

S_i = the number of a variable in a unit area (LGA)

S = the total number of that variable in the State

N_i = the number of people in a unit area (LGA)

N = the total number of people in the State

THE STUDY AREA

The study area is located between Latitudes 10° 31′ - 12°32′ North of the Equator and Longitudes 7° 33′ - 9° 30′ East of the Greenwich Meridian (Figure1). Kano State is one of the seven states that make up the North West geopolitical zone of Nigeria. It shares boundary with Katsina in the northwest, Jigawa State in the northeast, Bauchi State in the southeast and Kaduna in the southwest. It has total land area of 21,276.9 Square Km. Kano State has a projected population of 12,150,811 according to projected population (2017) figures report, Kano State Centre of Commerce (KSCC, 2013). The study area is mostly occupied by the Hausas and Fulanis. Agriculture is one of the most important pillars of the State’s economy with about 75% of the total working population engaged directly or indirectly in agriculture

as a means of livelihood (KSASC 2015). The principal food crops cultivated in abundance are tomatoes, millet, cowpeas, sorghum, maize and rice for local consumption while groundnuts and cotton are produced for export and industrial purposes (Zoml, 2013).

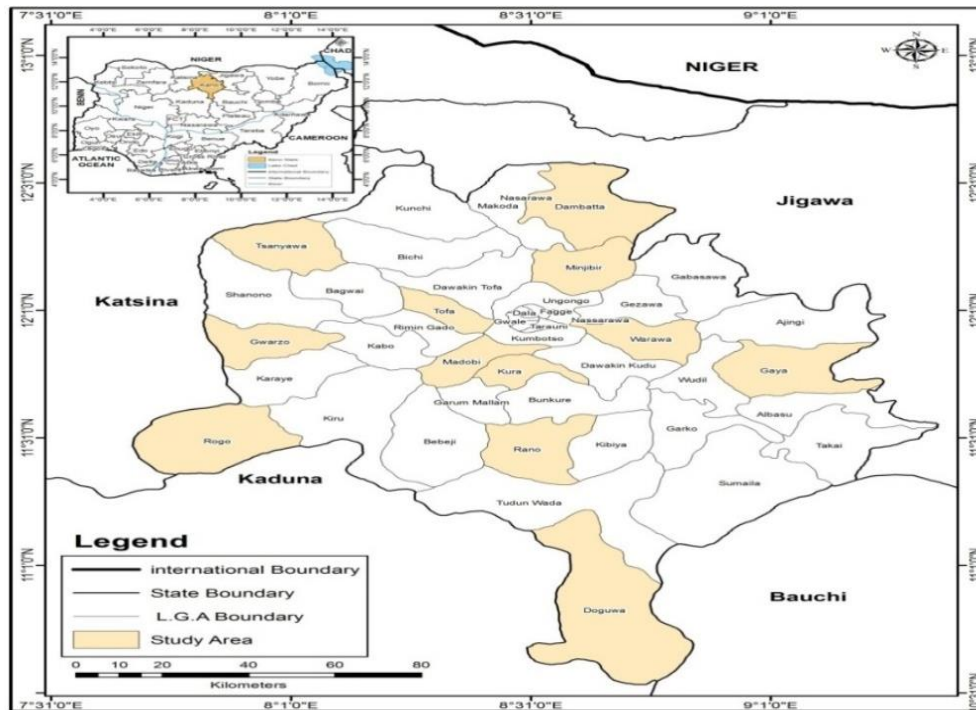


Figure 1: Kano State showing Study Area

Source: Modified from the Administrative Map of Kano State

RESULTS AND DISCUSSION

Spatial Variation of Infrastructural Dimension

In order to understand spatial balance of infrastructural dimension in the study area, location quotient technique was also employed. The infrastructural dimension indicators for agricultural development were;

- i. Access by Road (Km)
- ii. Commercial Banks and number of Financial Institutions

Table 1 presents the location quotient values for the twelve local governments LGAs in Kano state. The analysis reveals values for Gwarzo 0.29, Tofa 0.59 Gaya 0.67 and Warawa 1.00 rank first among the first category of developed areas in infrastructural facilities because these areas enjoy good roads, have access to bank loan and they receive assistance from agricultural development programmes.

Table 1: Spatial Balance in Infrastructures

LGA	LQ I	LQ II	Mean	Rank	Group
Gwarzo	0.46	0.11	0.29	1	Upper Third
Tofa	1.06	0.11	0.59	2	"
Gaya	0.56	0.78	0.67	3	"
Warawa	1.34	0.66	1.0	4	"
Madobi	1.14	1.08	1.11	5	Middle Third
Dambatta	0.47	1.77	1.12	6	"
Kura	0.44	1.93	1.19	7	"
Rogo	1.67	1.00	1.34	8	"
Tsanyawa	1.22	1.59	1.41	9	Bottom Third
Minjibir	1.55	1.9	1.73	10	"
Doguwa	2.33	1.44	1.89	11	"
Rano	2.43	2.38	2.41	12	"

Key: LQI = Access by Road LQII = Financial Institutions

Source: Field Survey (2016)

Table 1 revealed that developed areas within the middle comprise Madobi 1.11, Dambatta 1.12, Kura 1.19 and Rogo 1.34. The least developed areas at the bottom third include Tsanyawa 1.41, Minjibir 1.73, Doguwa 1.89 and Rano 2.41 in that descending order of performance. As reflected in Figure 2 some LGAs have achieved a more significant level in infrastructural development. This result shows that the infrastructural facilities are fairly spatially distributed in the state.

Figure 2 shows spatial pattern in infrastructural dimension in the level of agricultural development programmes among the twelve local government areas (LGAs) in Kano State.

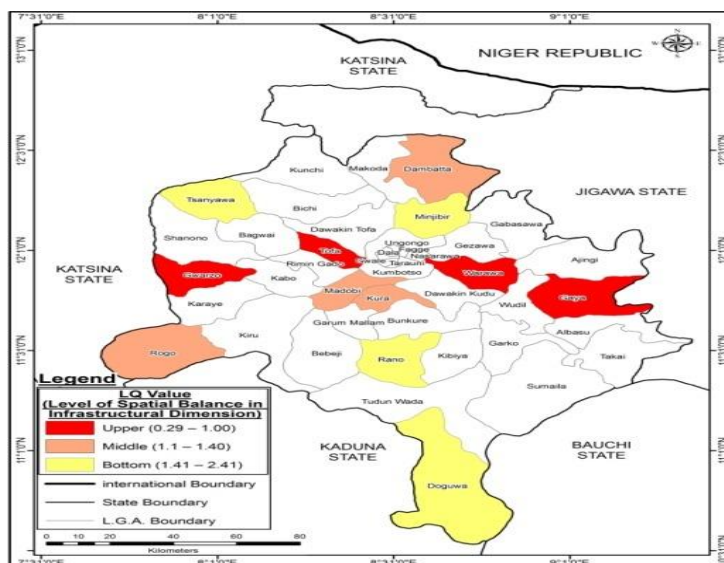


Figure 2: Level of Spatial Balance in Infrastructural Dimension in Kano State

Source: Field Survey (2016)

Spatial Variation of Farm Output Dimension

Table 2 presents the location quotient values for the twelve local government areas (LGAs) and the farm output dimension indicators are:

- i. Crop Intensity Per annum
- ii. Extension Workers
- iii. Chemical Fertilizer Consumption
- iv. Number of Agricultural Laborers

The analysis reveals that Tofa 1.05, Tsanyawa 1.29, Rogo 1.31 and Warawa 1.32 were ranked among the first category of developed area.

Table 2: Farm Output Dimension

LGA	LQIII	LQIV	LQV	LQVI	Mean	Rank	Group
Tofa	1.03	1.25	0.11	1.82	1.05	1	Upper Third
Tsanyawa	2.1	0.11	1.03	1.92	1.29	2	"
Rogo	0.9	2.11	1.23	0.99	1.31	3	"
Warawa	1.62	0.44	1.78	1.43	1.32	4	"
Dambata	2.03	1.28	1.48	0.56	1.34	5	Middle Third
Madobi	1.07	1.67	0.64	2.01	1.35	6	"
Gwarzo	3.0	0.21	1.25	1.18	1.41	7	"
Doguwa	1.67	2.06	1.65	0.38	1.44	8	"
Minjibir	2.87	2.12	0.55	0.32	1.47	9	Bottom Third
Gaya	2.31	1.33	2.0	0.76	1.60	10	"
Kura	2.22	1.99	0.78	1.43	1.61	11	"
Rano	0.99	2.21	3.73	2.01	2.22	12	"

Key: LQIII = Crop intensity LQIV = Extension workers LQV = Chemical fertilizers LQVI = Agric. Labourers
 Source: Field Survey (2016)

Moreover, the analysis of Table 2 reveals that developed areas within the middle comprise Dambatta 1.34, Madobi 1.35, Gwarzo 1.41 and Doguwa 1.44. The least developed areas at the bottom third include Minjibir 1.47, Gaya 1.60, Kura 1.61 and Rano 2.22 in descending order of performance, due to lack of fertilizer, the farm output per annum is low in these areas.

Figure 3 depicts spatial pattern in farm output dimension in the level of agricultural development programmes among the twelve local government areas (LGAs) in Kano State.

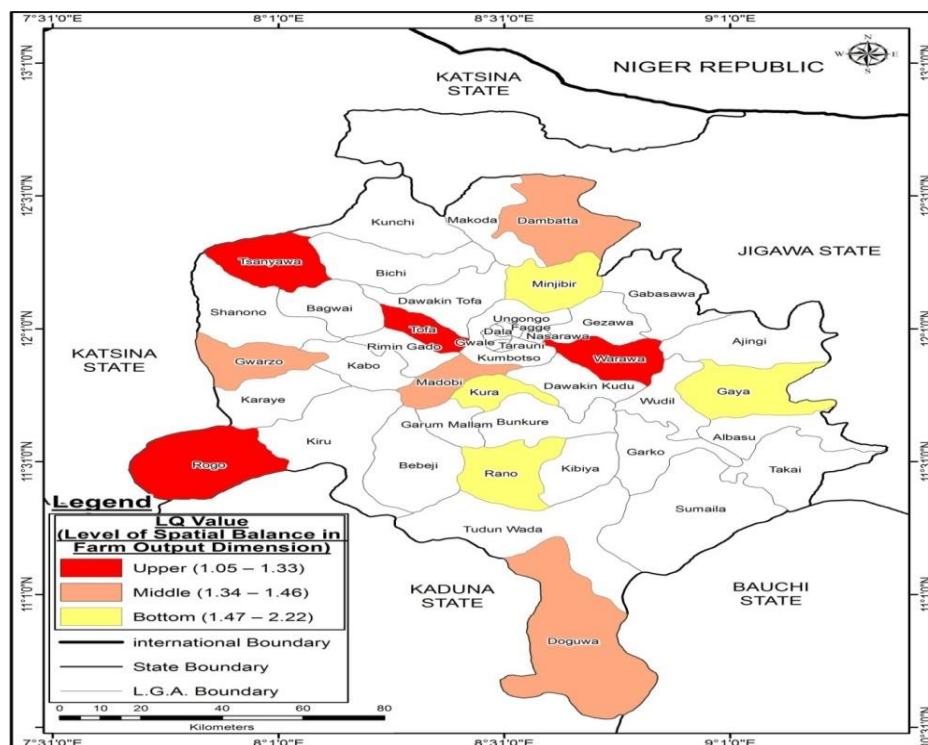


Figure 3: Level of Spatial Balance in Farm Output Dimension in Kano State

Source: Field Survey (2017)

As shown in figure 3 some LGAs in the study area fall within the least developed LGAs in the study area, which are geographically advantaged or disadvantaged as a consequence of uneven impact of nature, government policies, trade and others.

Spatial Variation of Farm Asset and Technology Dimension

The result of the location quotient technique is presented in Table 3 while figure 4 shows the spatial pattern of farm asset and technology dimension in the study area. The farm asset and technology dimension indicators are:

- i. Access to Land (heactres)
- ii. Number of modern equipment
- iii. Number of livestock
- iv. Number of poultry

Table 3: Farm Asset and Technology Dimension

LGA	LQ VII	LQ VIII	LQ IX	LQ X	Mean	Rank	Group
Tofa	0.12	1.09	0.23	1.18	0.66	1	Upper Third
Madobi	2.05	0.12	0.11	1.11	0.85	2	"
Kura	0.05	1.16	1.19	1.81	1.05	3	"
Warawa	1.15	1.12	0.59	1.87	1.18	4	"
Dambatta	2.88	0.56	1.76	0.55	1.44	5	Middle Third
Gaya	3.12	1.29	0.33	1.44	1.55	6	"
Minjibir	1.29	1.78	2.33	0.78	1.55	6	"
Tsanyawa	0.44	2.11	2.33	1.34	1.56	8	"
Gwarzo	2.11	1.22	2.54	1.37	1.81	9	Bottom Third
Doguwa	0.33	2.0	1.23	3.91	1.87	10	"
Rano	2.82	1.96	2.15	1.33	2.07	11	"
Rogo	2.25	9.22	0.99	1.77	3.56	12	"

Key: LQVII = Access to land LQVIII = Modern equipment LQIX = Livestock LQX = Poultry
Source: Field Survey (2017)

Table 3 revealed that Tofa 0.66, Madobi 0.85, Kura 1.05 and Warawa 1.18 rank among the first category of developed areas in farm asset and technology dimension, and all this LGAs are close to the urban centres. Tofa, Madobi, Kura, and Warawa were also ranked in the first category. They receive much assistance from agricultural development programmes.

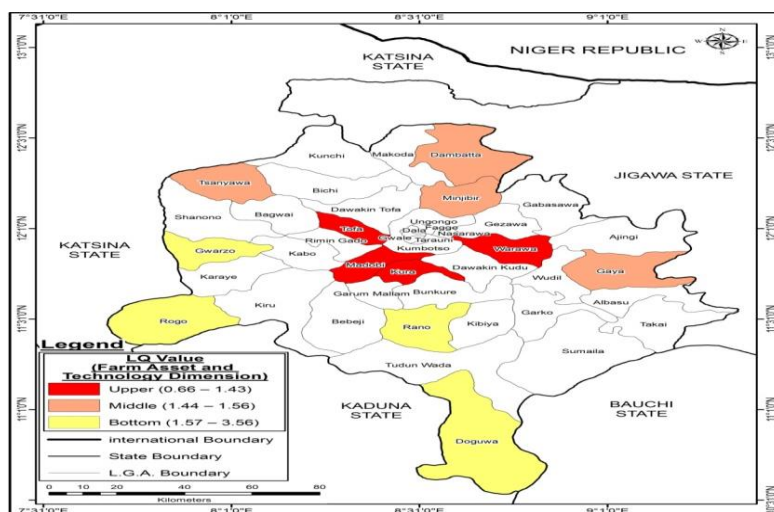


Figure 4: Level of Spatial Balance in Farm Asset and Technology Dimension in Kano State
Source: Field Survey (2017)

The LGAs that fall within the upper category of developed areas are compact and concentrated in the central part of the State, (Figure 4) with distant areas like Doguwa 1.87 and Rogo 3.56 receiving less support from agricultural development project. The least developed areas at the bottom third include Gwarzo 1.81, Doguwa 1.87, Rano 2.07 and Rogo 3.56 in that descending order of performance.

CONCLUSION

In a nut shell, there is a very high degree of variation within the study area. The problem of gap-narrowing is one that demands drastic reorientation of policy. It is viewed with all seriousness that after over five decades of independence there is hardly any excuse for the persistence of the wide gap, except on the ground of lack a sound policy to create the right atmosphere for the achievement of agricultural development programmes in Kano State and other states in Nigeria. .

RECOMMENDATIONS

1. There is need for the Agricultural Development Programmes to undertake their activities in lagging areas so that all the communities will have access to benefits and assistance from the Agricultural Development Programmes.
2. The Kano state government should as a matter of necessity, redesign the Agricultural Development Programmes to emphasize on the production of all crops.
3. There is need for the Kano State governments to provide assistance for both rainy and dry season farming because this research has discovered that most of the assistance were given during the dry season to boost irrigation farming

REFERENCES

- Adams, W. M. (1991). Large Scale Irrigation in Northern Nigeria: Performance and Ideology." *Transmission of the Institute of British Geographers Journal*, 16(3): 287-300.
- Adefila, J. O. (2014). Pattern of Agricultural Development in Southern Parts of Katsina State, Nigeria: Notion for Rational Planning. *IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)* e-ISSN: 2319-2380, p-ISSN: 2319-2372. Vol. 7, Issue 1 Ver. III, PP 14-20.
- Beyene, J., Erebor, O., Boucher, S. R. And Chandna, R. C. (2005). *Methods for Confidence Interval Estimation of a Ration Parameter with Application to Location Quotients*. PMID: PMC1274325. Accessed on 21st July, (2016).
- Cleveland, C. J. (2007). *Agricultural and Resource Economics Sustainable Development*. United Commerce in Kurawa I. A. (eds.). A Publication of Kano State Government.
- Harris, F, M. A., and Salisu M. (2003). Relying on Nature: Wild Foods in Northern Nigeria. *Journal of Ecology*. *Ambio* 32. 1:24-9.
- Igwe, C. F. (2015). Observations on the Spatial Patterns of Agricultural Production in Nigeria. Department of Geography and Environmental Management University of Port Harcourt Choba Port Harcourt. *Journal of Biology, Agriculture and Healthcare*. www.iiste.org ISSN 2224-3208 (Paper) ISSN 2225-093X (Online) Vol. 5, No.10.
- Iwouchukwu, J. C. and Igbokwe, E. M. (2012). Lessons from Agricultural Policies and Programmes in Nigeria. Department of Agricultural Extension. *Journal of Law, Policy and Globalization*. ISSN 2224-3240 (paper) ISSN 2224-3259 (online) Vol. 5.
- Kano State Agricultural Sector Committee, (2015). *Agricultural Sector Performance Review Report 2014*. Ministry of Agriculture, Kano State. Pp. 30 – 31.
- Krejcie, R. V. and Morgan, D. W. (1972). *Determinant Sample Size for Research Activities*. *Educational and Psychological Measurement*. 30: 607 – 610.
- Manyong, A. I., Olayemi, S. A., Yusuf, B. T., Omonona, V., Okoruwa, R. and Idachaba, S. F. (2005). *Agriculture in Nigeria Identifying Opportunities for Increased Commercialization and Investment*. International Institute of Tropical Agriculture (IITA), Ibadan Nigeria. Pp. 12 – 14.
- Mortimore, M. J. (2005) Dry land Development: Success Stories from West Africa. *Journal of Environment*. 45: 10-21.
- Okereke, O. (2000). Colonial and Post Colonial Agrarian Policies in Nigeria: Lessons and Polity Option in Aja, A. A. and Emeribe, A. (Eds.). *Policy and Contending Issues in Nigerian National Development Strategy*: Enugu: John Jacobs Classic Publishers. Pp. 29.
- Zoml (2013). *Kano State Center of Commerce*. Available@ info@zodml.org. accessed on 15/06/2016.