JOURNAL OF ARTS, MANAGEMENT SCIENCE AND TECHNOLOGY

VOL. 5 NUMBER 1

JANUARY, 2018

TETFUND/POLY/AUCHI/ARJ/11-13/02

Journal of Arts, Management, Science and Technology

A Call for Paper

Guide to Authors

1. Originality

Authors are expected to report results of original research not published elsewhere. A review with useful innovation may be considered for publication if the summaries of the articles contain information obtained from scattered literature that could stimulate research on the topic. The language of communication must be in English and spellings must be consistent with Oxford Dictionary.

2. Requirement

The original and two copies of the manuscripts should be submitted. Articles should be typewritten double-lined spacing on A4 paper with a 30mm margins on all sides in not more than fifteen (15) pages.

3. Title of Paper

It is mandatory that the title should unambiguously reflect the contents of the paper.

4. Names and address of the authors

The name(s) of the author(s) should follow the title. The address of the place where the research was conducted should be given. Avoid the use of titles for authors. Also e-mail address should be specified for easy reach, e.g impactanah@yahoo.com.

5. Abstract

The manuscript must include an abstract of a single paragraph not exceeding 150 words. The abstract should be clear and concise. The abstract should give the scope, purpose, procedures, significant results and conclusions of the research work.

6. Introduction

The introduction should contain the purpose or reason for the study being reported. Also, highlight of previous and related work is required. The literature cited must be discussed to show the relationship between the published work and the research study.

7. **Experimental**

Only highlights of procedures which are common knowledge should be included. Details should be referred to literature cited. New approaches or methodology should receive detailed attention.

8. **Results and Discussion**

The results and discussion should be combined. Direct repetition of methodology should be avoided under this section. Work should be related to published articles.

9. **S. I. Units**

The standard International Units should be used throughout. Unusual symbols should be defined when first mentioned.

10. **Tables, Graphs and Structural Formulae**

Tables and figures should be placed in the appropriate places within the text. Avoid grid lines. These must be prepared in such a way as to permit photo reproduction. Minimum character size must be 2.5. Where diagrams and graphs are provided, they should be incorporated into the manuscript and good transparencies provided. Structural formulae should carry Arabic numbers in the text and below the formula which should be drawn neatly within the typed manuscript. Lattra set symbols must be used.

11. **Nomenclature and abbreviations**

Authors are required to follow the nomenclature and abbreviations that are to be found in other reputable journals. Specialization terms, unusual abbreviations trade names and semi-ambiguous terms should be defined at first point of use.

12. **Reference**

References should be listed in a separate sheet, using the current APA format. Direct and indent quotations must carry the page number of the work cited. Every in text must appear in the references.

13. Computers/CD

On acceptance of a Manuscript (MS), the journal of Arts, Management, Science and Technology demands a CD of an error-free Manuscript Publication. The CD prepared on IBM compatible system using Word Perfect 6.0, page maker 6.0, MS Publisher, Window 2007 and above. Also, we can accept MS Prepared from systems running Microsoft Word and Microsoft Excel. You are required to state the programme system and file name as used on the CD. A virus-free CD is expected with a copy of the revised MS (Your CD will be returned provided a self-addressed stamped envelope accompanies the CD).

14. Page Charges

Handling and page charges are levied on authors. Each articles must be accompanied by an assessment fee of two thousand naira (₦2,000.00) only, payable of Engr. E. O. Edet, Editor-in-Chief, journal of Arts, Management, Science and Technology. Authors who wish to process their papers electronically can use the e-mail address - cridauchipoly@gmail.com

15. All subscriptions should be sent to:

Engr. E. O. Edet Editor-in-Chief, Journal of Arts, Management, Science and Technology (JAMST), Centre for Research, Innovation and Development (CRID), Auchi Polytechnic, P.M.B. 13, Auchi Edo State.

MINUTES OF MEETING OF PUBLICATION OF JOURNAL COMMITTEE HELD ON THE 26TH MARCH, 2019 AT THE CONFERENCE HALL OF CENTRE FOR RESEARCH, INNOVATION AND DEVELOPMENT (CRID) ATTENDANCE:-

1. Engr. E. O. Edet
2. R. I. Egwa
3. Professor A. A. Segymola
4. Professor M. I. Rilwan
5. Dr. N. A. Musa
6. A. C. Aizebioje Anthony
7. Dr. E.U. Tonukari
8. Dr. TPL. M. S. Jimah
9. Rev. G. E. Okpeodua
10. Idalu E. A. (Mrs.) Secretary

Opening Prayer:- The opening prayer was said by Dr. N. A Musa at about 10.17am

Presentation of the Proposed Agenda:-

1. Opening prayers
2. Welcome address/brief on Journal Publication
3. Any other business (A.O.B)
4. Closing prayer

Welcome Address: - The Assistant Director (CRID) welcomed everybody to the meeting and appreciated members of the Committee for their commitment. He briefed the house on what is required for the publication of the Journal. He mentioned that the papers, henceforth, should be vetted by a staff of the department, before sending them for external assessment. The Assistant Director thanked the members for attending the meeting despite the short notice and equally that they should disseminate the information to the Polytechnic to vigorously engage in publication of papers.

Brief on Journal Publications:- The Assistant Director briefed members of the Publication Committee on the way forward for the proposed publication of the Journal. That he wants the house to bring up ideas on how the vetting should be done before the external assessment will be carried out. The Committee unanimously agreed on the following:

1. Vetting of the papers should be done by three persons either within the institution or outside, and TETfund should pay for the vetting.
2. That the papers should be checked meticulously before being sent out for assessment. It was resolved that the vetting should be done by experienced professionals before sending the papers for external assessment.
3. That a staff from each School should be given the assignment of allocating the papers to capable hands for vetting. The Committee members representing each school are as follows:

1.	Dr. Wilfred	ICT
2.	Akhalume P. B	School of Business
3.	Engr. Akele	Engineering
4.	Mr. Balogun P.O	General Studies
5.	Dr. Festus Otoba	Art Design
6.	Al-Hassan	Environmental

4. That two members of the Publication Committee should finally go through the papers to ensure that they are error-free before collation.

A.O.B:- Mr. Balogun P.O. said it's very good to co-author a paper. That it has more advantages than one person authoring it. He also said that it's not good to put more than two papers from the same source in one journal. And that it is desirable to have papers published in the University Journals or International Journals as such publications would be easily accepted and considered valued.

A. C. Aizebioje Anthony moved a motion for adjournment at 11.17 am and supported by Dr. E.U. Tonukari who equally led the closing prayers at about 11:18am.

....

Mr. R. I. Egwa **Idalu E. A. (Mrs.)** `
Secretary

VOLUME FIVE NUMBER 1

TABLE OF CONTENTS

The Rate Of Students Withdrawal In Applied Sciences.(A case study of the Department of Statistics from 2006/2007-2015/2016

A.O. Bello (belloao2002@yahoo.com**); S. Iwelomen** (hakunamatata4live@yahoo.com);
M.J. Adams (michaeljude4@gmail.com);**O. Uanzekin** (suanzekin@yahoo.com).
Department of Statistics Auchi Polytechnic, Auchi

Abstract

Statistics as one of the applied sciences, is also one which is dreaded by the prospective students when they think of statistics. What comes to mind is mathematics and in Nigerian, the subject mathematics is seen to be most feared most by the students. Over the years, personal observation has shown that most of the students admitted into the department to study statistics originally did not intend to study the course. It has also be observed that the performance of most of the students are poor with only a very small fraction obtaining good grade. So Sincerely, most of the students dropout midway into the study on discovery that they cannot cope with the rigors that accompany the course. This paper examined the Rate of Students Withdrawal from the National Diploma (ND) programme in department of Statistics, Auchi Polytechnic, from the periods of 2006/2007 – 2015/2016 sessions. Just as students themselves report a variety of reasons for quitting school. This study has shown that there are two major factors accounted for student withdrawal such as voluntary withdrawal and advised to withdraw, the researchers also identifies a number of salient factors that appear to influence the decision. These factors include sickness, death, well-paying job etc.
KEY WORD: Withdrawal, Voluntary, Advised, National Diploma, statistics.

Introduction

Education is an instrument for developing the nation. It is also an instrument for developing hidden talents in an individual. It is the only means of eliminating illiteracy in any society. The importance of education to the development of individual and the nation cannot be over emphasized. It is a great investment any country can make for accelerating development of its technology, economic and human resources.

The issue of school withdrawal in Nigeria has been with us for a very long time. Fafunwa (1983) noted that dropout is one of the most serious problems that have continued to bedevil our educational system since independence in 1960 from the colonial administration. Even before our independence, the problem of dropout has established its grip on our educational system. This can be buttressed with the remark made by Nuffied foundations in (1953) that in the West coast of Africa, there is a considerable proportion of student's dropout of school each year.

Isife and Ogakwe (2012) explained that education is a powerful tool or weapon that can be used to eradicate ignorance, poverty, and diseases and produce individual that can function effectively in the society. Onwuka (2012) pointed out that education is the instrument that is used to free people from incapacitation and exclusion. When an individual is freed from incapacitation and exclusion or illiteracy, there is usually a change in that person's behavior. This change influences the person's attitude and his whole life (Apehende, 2013).

Researchers like; Mohsin, Aslam and Bashir (2004); De Cos (2005); Bridgeland, Dilulio, and Morison (2006), and Oghuvbu (2008) have since buttressed the fact that the issue of school withdrawal is a global problem confronting the education industry round the world.

There have been series of studies on the issue of withdrawal from school and this issue has been termed a global one. The crux of this study is on course of study chosen by the student from which he or she decides to back out and as such he or she has definitely withdrawn from the institution. It is on this note that we shall review literatures on student withdrawal from school, which is on a general scale.

School withdrawal in its simplest meaning is the untimely withdrawal from school. These students who withdrew voluntarily or are advised to withdrawn due to their inabilities to cope with the course, end up not obtaining the said certificate of graduation. The issue of school withdrawal is a global problem confronting the education industry round the world.

Studies by Mohsin, Aslam and Bashir (2004); De Cos (2005); Bridgeland, Dilulio, and Morison (2006), and Oghuvbu (2008) have since emphasized the fact that the issue of school withdrawal is a global problem confronting the education industry round the world. Withdrawal from school in Nigeria has been with us for a very long time. Fafunwa (1983) study showed that dropout is one of the most serious problems that have continued to bedevil our educational system since independence in 1960 from the colonial administration. Even before our independence, during the colonia administration, the problem of dropout has already established its grip on our educational system. This study has come at a time when there is high rate of insecurity in the country as a result of various social and economic menace. Most of their nefarious acts are perpetrated by those who have either dropped out or have not been in school or have even graduated from higher institutions. Although our emphasis here though is on those who have dropped out of school.

De Cos (2005) commenting on the importance of graduation from higher institution noted that; with the economy changing from a dependence on manufacturing towards more reliance on technology, services, and a "knowledge economy", the need for education up to tertiary level has grown.

In Nigeria of today, Diplomal or Bachelor degree from tertiary institution is considered as the minimum required for most jobs and status positions. This development has serious implications for the economic well being of dropouts and the society at large. In this era of global economic meltdown and global economic competitiveness, Nigeria as a nation that has vision must make concerted efforts to raise the educational attainment of all its youths who are the leaders of tomorrow. Globally, reasons why students dropout from school can be categorized into four clusters. These include; School related, Job related, family related, and community related.

Authors like Frendenberg and Ruglls (2007) did identified twenty four factors under family cluster; three factors under community cluster and twelve factors under school cluster.

The factors identified under family cluster include; low family socioeconomic status, racial or ethnic groups, male, special education status, low family support for education, low parental education, residential mobility, low social conformity, low acceptance of adult authority, high level of social isolation, disruptive behaviour conduct, being held back in school, poor academic achievement, academic problems in early grades, not liking school, feelings of "not fitting in" and of not belonging, perceptions of unfair or harsh disciplines, feeling unsafe in school, not engaged in school, being suspended or expelled, conflicts between work and school, having to work and school, having to work or support family, substance use and pregnancy.

Under school related cluster, these factors were identified; low socioeconomic status of school population, high level of racial or ethnic segregation of students, high proportion of students of colour in school, high proportion of students enrolled in special education, location in central city, large school district, school safety and disciplinary policies, high-stakes testing, high number of students –to- teacher ratio, academic tracking, discrepancy between the racial or ethnic composition of students and faculty, and lack of programmes and support for transition into next level. While job related cluster entails: those students who could not work and school at the same time, those who had to do a job to survive and those who found job. In all of this factors identified by Frendenberg and Ruglls, we observed that there is one factor that has existed and but treated as a minor but contribute to withdrawal in our society. The factor is "Change of course". This factor, though not in the light but has contributed to withdrawal because a student whose intents is to study for instance course A is now been made to study course B and alonge the line may not be able to cope thereby deciding to withdrawn from school. This is common in most institution in Nigeria. especially those changing to the numeric science from Art.

We observed that most students accept the offer for so many reasons which naturally are insignificant. In most cases we have had course to counsel some of the students so as to make informed decision. To identify specific causes of withdrawal, many empirical research literature has beamed research light into numerous explanatory variables of Polytechnic withdrawal. The empirical research comes from a number of social science disciplines and is generally based on an *individual perspective* that focuses on individual factors such as students' social life, attitudes, behaviors, school performance, and prior experiences; and an *institutional perspective* that concentrates on the contextual factors found in students' families, schools structure, communities, and peers.

A number of studies have been reviewed in this literature (Finn, 1989; Hammond, Linton, Smink, & Dew, 2007; Rumberger, 1987; Rumberger, 2004) and the literature on the related phenomenon of student engagement (Fredricks, Blumenfeld, & Paris, 2004; National Research Council, Committee on Increasing Polytechnic Students' Engagement and Motivation to Learn, 2004) and student mobility (Rumberger, 2003). The last comprehensive reviews of the withdrawal literature were done in the 1980s (Finn, 1989; Rumberger, 1987). Since that time, a large number of empirical studies have been published.

Tinto's Theory

Sense of Belonging and Student Persistence

Perceived sense of belonging in academic environments has a powerful effect on students' emotional, motivational, and academic functioning from anxiety, distress, engagement, competence to self-referent thoughts and even to dropping out. Undergraduate student persistence is a broadly studied topic within the field of higher education studies. Key in this work is the research of Tinto (Tinto, 1975; Tinto, 1988; Tinto, 1993; Tinto, 1997; Tinto, 1998). Focusing on institutional structural factors, Tinto's theory posits that early withdrawal is impacted by a variety of factors. As students come into an institution, they do so with a variety of backgrounds, intents, and commitments.

A key aspect of Tinto's model is concerned with the interactive effects of academic and social experiences on a student's decision to remain at an institution. Tinto's model asserts that students who engage in formal and informal academic and social integration experiences are less likely to leave their institution. Also, individuals reformulate goals and commitments as a result of integrative experiences; positive experiences reinforce commitment. Tinto's model is multi-faceted and considered three groups of variables.

1. 'Pre-college characteristics', such as, family background, skills and abilities and prior schooling experiences;
2. College experiences, such as students' area of study, academic performance (grade point average), and the amount and quality of student-faculty

interactions. These are seen as indicative of students' level of academic integration in the college environment.

3. Students' out-of-class experiences, such as participation in extracurricular experiences, including paid work, and student-student interactions. These represent students' social integration in college.

Theory of student withdrawal by an educator

Braxton et al. (2000) (building on Braxton et al. 1997) sought to elaborate Tinto's theory of student withdrawal. They sought to estimate the influence of such forms of active learning as class discussions, examination questions, group work, and higher-order thinking activities on social integration, subsequent institutional commitment, and student departure decisions.

A longitudinal study (three surveys: at orientation, in semester one and in semester two) of 718 first-time, full-time, first-year students at a highly selective, private research university indicated that active learning influenced social integration, subsequent institutional commitment, and intent to return.

A subsequent edited book (Braxton, 2000) focused on the first year and included a reworking of Tinto's 'interactionalist' perspective. Following critiques of the theory, the contributors offered a variety of both theoretical and methodological perspectives on student departure leading to recommendations to institutional administrators. Contributions also included minority student retention, the link between polytechnic choice and student persistence, and the effect of the classroom experience on the student's choice.

Furthermore, in another text designed to further adjust Tinto's theory, Braxton and Hirschy (2004) examined institutional commitment and integrity. They argued that institutional integrity (the congruence of the actions of managers, administrators and teachers to the mission and values of the institution) and communal potential (the student-perceived possibility of an affinity group) are important concepts.

They concluded that the greater the level of institutional integrity and commitment to the welfare of the student the more likely the student will achieve social integration and hence the more likely they are to persist. Similarly the stronger the perception of the communal potential of campus life the more integrated the student is likely to become.

Statement of the problem

Statistics as one of the applied sciences is also one which is dreaded by the prospective students as when they think of statistics, what comes to mind is mathematics and in Nigerian, the subject mathematics is seen to be one feared most by the students. Over the years, personal observation inquiry has shown that most of the students admitted into the department to study statistics originally did not intend to study the course. It has also be observed that the performance of most of the students are poor with only a very small fraction obtaining good grade.

Sincerely, most of the students dropout midway into the study on discovery that they cannot cope with the rigors that accompany the course. In the present time, student withdrawal is very obvious, and this is the rational for this study. It is expected that the number of students admitted should also graduate, but we are not silent on some of them having to spill over. we therefore want to empirically study this problem of withdrawal so as to be able to make useful suggestions to reducing if not completely putting an end to it.

This study was carried out to examine student withdrawal rate from the department and proffer a statistical analysis of the rate of students withdrawal from numeric science using Statistics as a case study.

Prior to the above statement, one would begin to pounder on the following questions:

- ►What natures of student withdrawal are most common in numeric science?
- ►What are the causes of student withdrawal?
- ►What can be done to reduce student withdrawal rate?

Objectives of the study

The following are the objectives of this study:

- ►To examine the rate of student withdrawal.
- ►To identify the factors responsible for student withdrawal.

Methodology, Data Presentation, Analysis and Discussion.

1. The study is descriptive in nature as it attempts to study the rate at which student withdrawn from course of study as it relates to numeric science which in turn leads to students withdrawal from school.

2. The data for this study was collected using the secondary method. The data were collected from Field work and Extracted from statistics published academics results on notice board for the period under study.
3. We collected the data for the number of student admitted in a given year and the number of same student graduating in the following year, and then determined the number of student that withdrawn from the programmed. This was done for the ten years under study
4. The analysis involve the use of rate, chart and correlation analysis.

Table 1: Data on Number of Students from ND Programme

YEAR OF GRADUATION	NUMBER WITHDRAWN
2007/2008	1
2008/2009	7
2009/2010	4
2010/2011	5
2011/2012	2
2012/2013	12
2013/2014	25
2014/2015	47
2015/2016	56
2016/2017	62
	221

SOURCE: Field work/ Extracted from statistics published academics results on notice board.

Figure 1: Bar chart of withdrawal rate

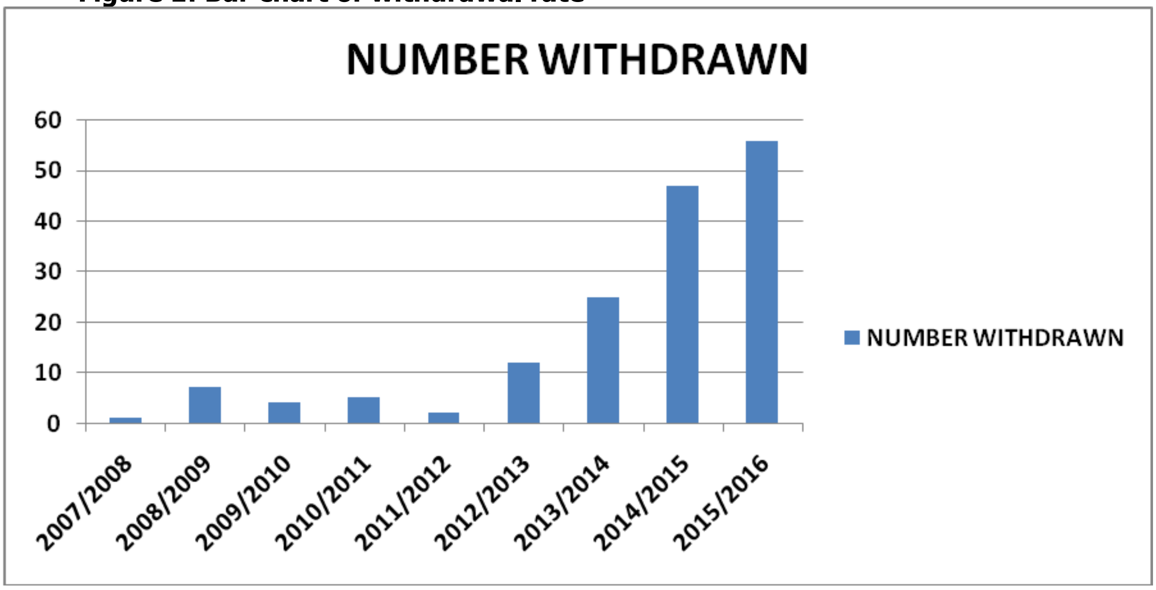


Figure 2: Line graph of withdrawal rate

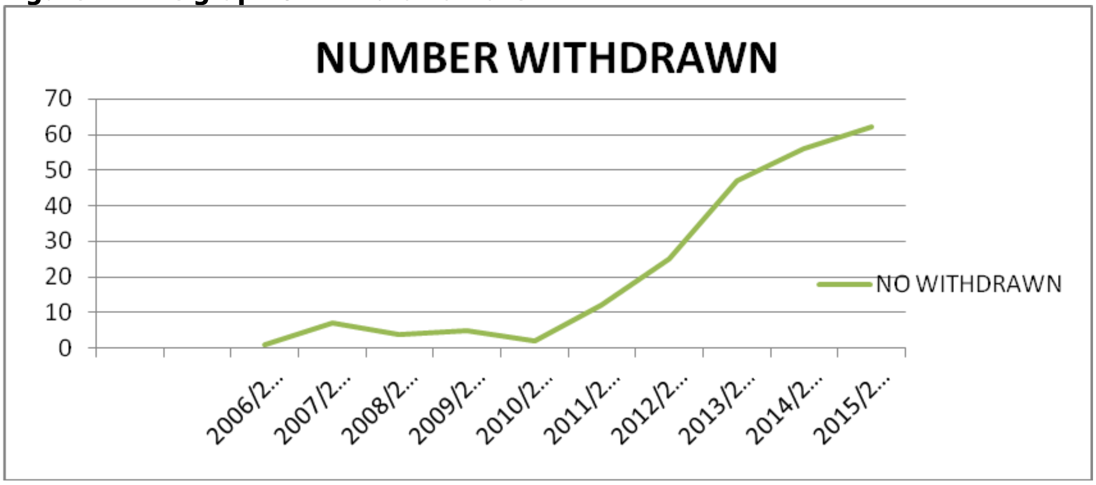
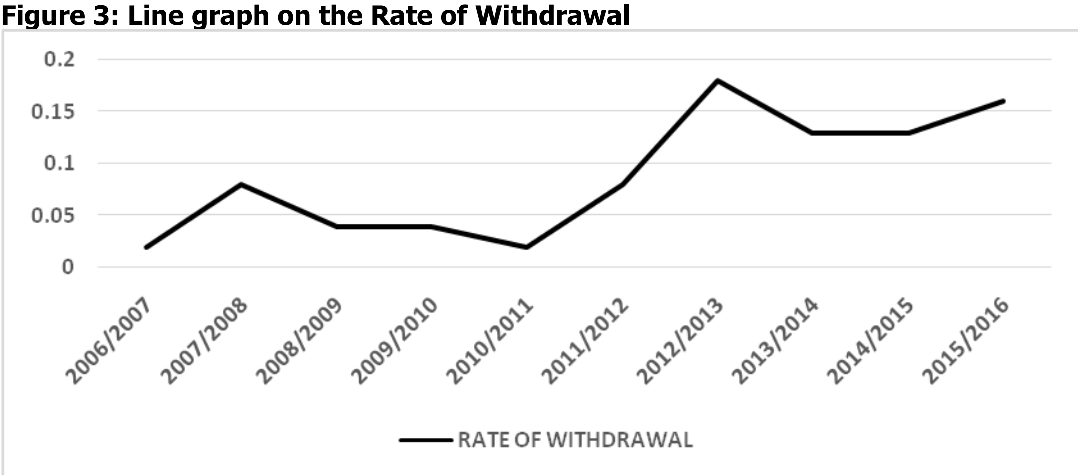


Table 2: Rate of students withdrawal

YEAR OF ADMISSION	NUMBER WITHDRAWN	RATE OF WITHDRAWAL
2006/2007	1	0.02
2007/2008	7	0.08
2008/2009	4	0.04
2009/2010	5	0.04
2010/2011	2	0.02
2011/2012	12	0.08
2012/2013	25	0.18
2013/2014	47	0.13
2014/2015	56	0.13
2015/2016	62	0.16
TOTAL	221	

SOURCE: Author's computation

Figure 3: Line graph on the Rate of Withdrawal



Discussion

Series of research studies have centered on factors influencing school withdrawal from school on a general space of school withdrawal without emphasis on institutions policies and practices. One of these practice is that of change of course of study with or without the consent of the prospective student. Some of these studies have also attempted to build theoretical models in explaining the relationship between the factors and school withdrawal.

This study concentrate on withdrawal from a specific course of study which is a member of space of numeric science, though also leading to withdrawal from school. The results from the analysis showed that the rate of withdrawal is on the increase and this we can attribute to the "change of course" practice in the institution and the search for "greener pastures" overseas. We did observed closely and by interaction that in recent time most of the students ($\geq$ 80%) did not originally apply to study the course and being a numeric science. Faced with the rigors associated with the study of the course, the weak students take to engage in examination malpractice and when caught are either asked to rewrite the exam the following year, rusticated or expelled. Expulsion is another form of withdrawal as listed by Frendenberg and Ruglls (2007).

Conclusion

The rate of students withdrawing from Applied sciences, thereby withdrawing from school is on the increase as shown by our studies using the study of Statistics as case study. This study has shown that there are two major factors accounted for student withdrawal such as voluntary withdrawal and advised to withdraw other factors could be responsible that are subject to further research study. However, studies have identified a number of salient factors that appear to influence the decision.

Our submission here is that management of schools should admit those students who had the genuine intent to study the course or those who have received well-coordinated orientation or counseling program on choice of course, especially to the numerate science in other to reduce the rate of withdrawal occasioned by the factor. A student who enjoys what he or she does will fight to the end to graduate from the programme.

Proposal for future study

The scope in this work has been based solely on the department of Statistics of Auchi Polytechnic, Auchi. In view of the inherent rate of withdrawal that could still be in other department of the institution, we therefore recommend that further work should be carried out on a larger scale and empirical work done on the factors by studying those who have actually withdrawn from school and not on those still in school.

Reference

Apehende, E.U. (2013). /Reforms and innovation of the primary education system in Nigeria. /In Akpangban, E; Eya, P. EIgboji & Waekwa, P. C. (Eds). Reforms and innovation in Nigerian Education (pp.177- 178) Kano: West and Solomon publishing Coy Ltd.

De Cos, P.L. (2005). Polytechnic withdrawals, enrollment, and graduation rates in California. California: California Research Bureau, California State Library.

Fafunwa, A.B. (1983). Dropout in the Nigeria education system. In S.A. Adesina, &Ajayi, E. (Eds) Nigeria Education Trends and Issues. Ile Ife: University of Ife Press, Nig. Ltd.

Freudenberg, N., &Ruglls, J. (2007). Reframing school withdrawal as a public health issue. [Online] Available: http//www.cdc.gov/pcd/issues/oct/07 (July 6, 2010).

Isife, C.T&Ogakwu, U.N .(2012). /Problems and innovations of education in Nigeria. In O.TIbeneme; B Alumode& H. Usoro (Ed). The state of education in Nigeria. Kano: west and Solomon pub. Co. ltd

Mohsin, A.O., Aslam, M., & Bashir, F. (2004) Causes of dropouts at the secondary level in the Barani areas of the Punjab (a case study of Rawalpindi district). Journal of Applied Sciences, 4 (1); 155-158. http://dx.doi.org/10.3923/jas.2004.155.158

Oghuvbu, E.P. (2008). The perceived home and school factors responsible for dropout in primary schools and its impact on National development. Ekpoma Journal of Behavioural Sciences, 1, 234-235

Onwuka, E.C. (2012). Perspectives on education and development: An appraisal of Nigeria's experience. Multidisciplinary Journal of Research Development /20(1), 1-5.

Tinto (Tinto, 1975; Tinto, 1988; Tinto, 1993; Tinto, 1997; Tinto, 1998). Focusing on institutional structural factors.

EFFECT OF DIFFERENT DRYING METHODS ON PROXIMATE COMPOSITION OF *MORINGA OLEIFERA* LEAVES

Dania, M.I.., Dania, S. O., Oladebeye, A.A., Olukoya, F.O. and Adejumo, P.O.
Department of Food Technology, Federal Polytechnic, Auchi, Edo State, Nigeria.

***Corresponding author's e-mail: megomo2013@gmail.com; GSM 07060565347**

Abstract

The preservation of green leafy vegetables is very important. The leaves of *Moringa oleifera* have various uses in human life. *Moringa oleifera* leaves can be used in various foods like soup, sauces and it can also be used for medicinal preparation. In this present investigation effort was made to prepare powder of *M. oleifera* by applying drying techniques viz air drying, sun drying and oven drying. The oven drying was carried out at 60^0C to minimize loss of nutrient. The protein, crude fibre, moisture content, carbohydrate composition, ash content as well as energy values of the plant showed significant differences across the drying methods at $p<0.05$. Air dried sample had the highest values of protein (21.58±0.21), carbohydrate (25.37±0.53), crude fibre (11.08±0.19) and energy value (1478.20±1.31) compared to oven dried sample with lowest values of carbohydrate (20.19±0.71) and crude fibre (9.91±0.41). There is need for awareness programme on the inherent nutritional values of *M. oleifera* leaves so as to encourage its consumption and incorporation in infant weaning food.

Keywords: *Moringa oleifera* leaves, proximate composition, different drying methods, nutritional

values

Introduction

Moringa oleifera, commonly referred to as the drumstick, is a tree native to India, but has been planted and naturalized in many other part of the world, including Nigeria in Africa. It is the most widely cultivated and known variety of the genus *Moringa*, family Moringaceae (Fuglie, 2001). *Moringa oleifera* is also known by many other common names. In the Philippines, where the leaves are cooked and fed to babies, it is called mother's best friend or 'mallungay'. Other names include benzolive tree (Haiti), horse raddish tree (Florida) and nebeday (Senegal) (Price, 2002). In Nieria, it is known as 'Zogale' in Hausa, 'Okwe Oyiibo' in Igbo 'Ewelle' in Yoruba and Jequl-agede' in Tive (Olushola, 2006).

The leaves, seeds and flowers of *M. oleifera* all have great nutritional and therapeutic value (Olushola, 2006). The seeds are eaten like peas or roasted like nuts, while the flowers are eaten when cooked and taste like mushrooms (Price, 2000). The leaves are outstanding as a source of Vitamin B, C, Provitamin A as beta-carotene, Vitamin K, protein and minerals (Peter, 2008). The leaves can be cooked and eaten as a vegetable like spinach. More often they are dried and grounded into powder and used in soups and sauces. The health benefits are lowering of blood sugar and blood pressure (Rajanga, 2001). In Africa, its consumption by nursing mothers has been reported to produce more milk. Severely malnourished children were reported to have significant weight gain when the leaves were added to their diet (Price, 2000).

In many developing countries, like Nigeria, meals are mainly starch; addition of *M. oleifera* to such diets either fresh or dried could help combat malnutrition (Fuglie, 2001). Despite the potential nutritional and health benefits of *M. oleifera* leaves, processing methods can lead to loss of nutrients. *M. oleifera* is especially promising as a source of nutrients in the tropics where the tree is leavy at the end of the dry season when other foods are typically scarce (Faley, 2005). The aim of this study was therefore to assess the effect of different drying methods on the proximate composition of *M. oleifera* leaves.

Material and methods

Materials

M. oleifera leaves, hot air oven, filter paper, laboratory milling machine and air tight containers, desiccators, crucibles, soxhlet apparatus, H_2SO_4, NaOH, kjeldahl digestion flask.

Collection of plant material

M. oleifera leaves were collected from Auchi Polytechnic New Staff Quarter, Auchi, Edo State, Nigeria. The leaves were sorted, rinsed and processed.

Sample preparation

Preparation of moringa leaves for drying was as described by Gernah and Sengev, 2011

Sorting

Fresh, green, undamaged, non-insect infested leaves were selected while the bruised, discoloured, decayed and wilted leaves were removed.

Rinsing

The stalks of the leaves were cut from the main branches and the leaves were rinsed with slightly warm water to remove all the adhering dust, dirt and particles. The sample was then divided into three batches for the drying methods.

Drying Techniques

Two hundred grams of *M. oleifera* leaves were weighed into three stainless trays overlaid with filter paper for oven, sun, and air drying.

Sun drying

Two hundred grams of *M. oleifera* leaves were spread on stainless tray overlaid with filter paper and placed where they can have adequate amount of sunlight.

Air Drying

Two hundred grams of *M. oleifera* leaves were spread on stainless tray overlaid with filter paper and kept in a room which was well ventilated.

Oven drying

The oven was preheated to 60^0C and 200 g of the *M. oleifera* leaves spread were on stainless tray overlaid with filter paper and placed in the oven maintained at 60^0C until leaves were complete dried.

After the drying processes the dried plant samples were grounded to coarse powder using laboratory milling machine and stored in an air tight container for further analysis.

Proximate analysis

Ash, moisture, crude fibre, protein carbohydrate and fat contents were determined by methods of AOAC, 2000.

Total Ash Content

An empty silica crucible was ignited at 60^0C in a furnace for 30mins, cooled and pre-weighed (W_1), 2 g of the samples each was added and re-weighed (W_2). The crucible and content was placed in a muffle furnace at 550^0C until a white ash was obtained. The crucible was then cooled in desiccators and weighed (W_3). The amount of ash obtained was expressed as percentage of the total sample.

$$\% \text{ ash} = \frac{(W_3 - W_2)}{(W_2 - W_1)} \times 100$$

Crude Protein Content

The crude protein content was determined by the micro-kjeldahl method. Two grams of the sample was weighed and transferred into micro kjeldahl digestion flask. Four ml concentrated H_2SO_4 was added. The sample was heated for 5 minutes at 440^0C. Sixteen ml H_2SO_4 was added to make the sample colorless. 100 ml deionzed water was added and mixed. Three drops each of mineral stabilizer and polyvinyl alcohol were added. 1ml Nesslar reagent was added. The resultant sample was read at 460 nm on spectrophotometer against deionized water as blank. The gram nitrogen obtained was multiplied by the factor 5.25 to obtain the crude protein.

Crude Fibre Content

200 ml freshly prepared H_2SO_4 (1.25 %) was added to 2 g of *M. oleifera* samples were boiled for 30 minutes. The sample so treated was no longer acidic. The sample was then boiled in 200ml NaOH (1.25%) for 30 minutes. This was filtered and rinsed with boiling water until filtrate was no longer basic. The residue was dried in the oven in a pre-weighed crucible (W_2), the weight of crucible and content was taken after cooling in the desiccators (W_4). The difference in weight between the initial and final was expressed as a percentage of the total amount of sample as the crude fibre.

$$\% \text{ crude fibre} = \frac{(W_4 - W_3)}{W_1} \times 100$$

Determination of moisture content

The moisture contents of the samples were determined using the air-oven drying method. The crucibles were washed, dried in the oven and allow to cool in desiccators and weighed (W_1). Each sample was put in the crucible and reweighed (W_2). The crucibles holding the samples were then dried in the oven at 105^0C for 6 hours. The process of drying, cooling, and weighing was continued until constant weight was obtained (W_3).

The percentage moisture was calculated as follows

$$\%\text{Moisture content} = \frac{\text{moisture loss}}{\text{Sample weight}} \text{ X } 100\% \quad \text{i.e } \frac{W_2\text{-}W_3}{W_2\text{-}W_1}$$

Fat content

Two grams of each *M. oleifera* sample was weighed into a thimble shaped filter paper (W_1) this was placed in the soxhlet apparatus, attached to a receiving flask which was pre-weighed (W_2) extraction was carried out under reflux for five hours. After which extracting solvent was recovered and the remnant of the solvent was evaporated in the oven for about 30 minutes as 105^0C. The flask was cooled in the desiccators and was re-weighed until a constant weight was obtained (W_3). The weight of fat extracted from the sample was calculated as the difference between the final and the initial weight of the receiving flask, and expressed as the percentage of the total sample.

$$\% \text{ fat} = \frac{(W_3 - W_2)}{W_1} \times 100$$

Carbohydrate Content

The carbohydrate was obtained by difference (Ihekoronye and Ngoddy, 1985). That is, the sum of the other proximate parameters (moisture, ash, fat, protein, fibre) was subtracted from 100.

% carbohydrate = 100% - (sum of % moisture, ash, fat, crude fibre and protein).

Energy Content

Energy contents of the samples were calculated by multiplying the protein, fat and carbohydrates by factors 17, 37, and 17 in KJ, respectively.

Result and discussion

The proximate composition of *M. oleifera* leaves dried using three methods is presented in Table 1 below. All the parameter analysed were significantly higher ($P<0.05$). The ash content (13.89 ± 0.50^a) in air dried *M. oleifera* leaves was highest compared to the ash content of sun and oven dried (10.66 ± 0.11^b and 10.09 ± 0.23^c) respectively. The moisture content in the three samples of the dehydrated leaves was in the range of 9.43 ± 0.13^a -5.69 ± 0.09^c Highest moisture content was observed in air dried sample (9.43±0.13) while oven dried sample (5.69±0.09) had the least. Fat content of the three dried leaves samples was in the range of 2.77 ± 0.12^a - 2.14 ± 0.13^c. The fat content was highest in the air dried sample 2.77 ± 0.12^a and lowest in the oven dried sampled 2.14 ± 0.13^c. The crude fiber content of the air dried sample was highest (11.08 ± 0.19^a) while the crude fibre content of oven dried sample was lowest (9.91 ± 0.41^c). The *M. oleifera* sample is a rich source of fibre. Though fibre content does not contribute nutrient to the body, it add bulk to food which facilitate bowel movement and prevent gastrointestinal diseases in man (Gordon, 1999; Rajanga, 2001). Fibre has been reported to cleanse digestive tract by removing potential carcinogens from the body and hence prevents the absorption of excess cholesterol (Lisa, 1997).

Fibre also adds bulk to food and reduces the intake of excess starchy food which is the characteristic of the diet of the poor and locals, thereby guard against metabolic conditions such as hypertension and diabetes mellitus (Adeyemi *et al.*, 2014).

The protein content in the three dried samples was in the range of 21.58 ± 0.21^a – 21.20 ± 0.17^b with the highest value in air dried sample and least value in sun dried sample. Protein is an essential constituent in the body to produce new tissues. Protein inclusion in diet is therefore important for growing children and pregnant women. The recommended daily intake of protein for pregnant and breastfeeding women is about 38g (Muller, 1988). A meal of 100 g *M. oleifera* leaves will satisfy this protein need (Gammam and Sherrington, 1990). Carbohydrate content of the dried *M. oleifera* leaves samples was in the range of 25.37 ± 0.53^a- 20.19 ± 0.71^b. The carbohydrate content in the dehydrated powder of air dried sample was highest. This is within the range reported by Gernah and Sengev, 2011. The energy value of the three dried samples of dried *M. oleifera* leaves was in the range of 1478.20 ± 1.31^a -1419.04 ± 1.83^c. Energy value was highest in the air dried sample while the least energy value was in the sun dried sample.

Conclusion

It can be concluded that the air drying method was the best method of dehydrating *M. oleifera* leaves due to the fact that it had a better retention of nutrients like protein, fat and carbohydrate. Dehydration technique can be used as one of the most possible strategy for preserving green leafy vegetables, which are highly seasonal and perishable.

Table 1: Proximate composition of *M. oleifera* leaves subjected to three different drying methods

Parameter	Fresh	Air drying	Sun drying	Oven drying
Ash	2.25±.02	13.89 ± 0.50^a	10.66 ± 0.11^b	10.09 ± 0.23^c
Moisture	70.04±0.01	9.43 ± 0.13^a	5.94 ± 0.20^b	5.69 ± 0.09^c
Fat	4.50±0.10	2.77 ± 0.12^a	2.17 ± 0.30^b	2.14 ± 0.13^c
Crudefibre	2.86±0.02	11.08 ± 0.19^a	10.48 ± 0.40^b	9.91 ± 0.41^c
Protein	7.24±0.05	21.58 ± 0.21^a	21.20 ± 0.17^b	21.28 ± 0.32^b
Carbohydrate	10.84±0.06	25.37 ± 0.53^a	22.95 ± 0.61^b	20.19 ± 0.71^b
Energy value	835±0.17	1478.20 ± 1.31^a	1419.04 ± 1.83^c	1465.07 ± 1.01^b

Values are means ±standard deviations of triplicate determinations. Means with different superscript within the same row are significantly different ($p\leq0.05$).

REFERENCES

Adeyemi, S.B., Ogundele, K.O. and Animasaun, M.A. (2014). Influence of drying methods on the proximate and phytochemical composition of *Moringa oleifera* Lam. *Global Journal of Medicinal Plant Research,* 2(1): 1-5

AOAC, (2000).) Association of Official Analytical Chemists. Official Methods of Analysis 14th edition, Washington, pp 806-842.

Faley, W. (2005). *Moringa oleifera*: A review of the medicinal evidence for its nutritional therapeutic,and prophylacticproperties.(http://www.tfljournal.org/article.php/200511249315862)

Fuglie, L.J. (2001). The Miracle Tree: The Multiple Attributes Of *Moringa*. Church World Service, West African Regional Office, Dakar, Senegal Pp 103-136.

Gamman, P.M. and Sherrington, K. B. (1990). The Science of Food. An Introduction to Food Science, Nutrition and Microbiology. 3rd Ed. Perngamon Press, Oxford and New York pp103-136.

Gernah, D. I. and Sengev, A. I. (2011). Effect of processing on some chemical properties of the leaves of the drumstick tree (*Moringa oleifera*). *Nigerian Food Journal* 29(1):70-77.

Gordon, M. W. (1999). Perspectives in nutrition. 4th Ed. McGraw Hill pp75-372.

Ihekoronye, A. I. and Ngoddy, P.O. (1985). Integrated Food Science and Technology for the Tropics. Macmillian Publishers Ltd. London. Pp 165-193.

Lisa, L.P.(1997). Wild plant food in agricultural environment: A study of occurrence, management and gathering rights in North East Thialand. Human Organization, 56: 209-221.

Muller, H. G. (1998). An Introduction to Tropical Food Science. Cambridge University Press pp59-64.

Olushola, A.T.E. (2006) "The Miracle Tree", *Moringa oleifera* (Drumstick). In Achieve Vibrant Health With Nature, Keep Hope Alive Series 1 Unijos Consultancy Limited Press, Jos, Nigeria Pp 120-136

Peter, A. K. (2008) Under Utilized And Under Exploited Horticultural crops: volume4(http;//books.google.com/book?id=IPo72mr2cc&Ipg=pA11&dq=moringa%20oleiferapg=PA112|v=onepage&f=false).

Price L.L. (2000) The *Moringa* Tree www.echonet.org Accessed On 14/11/2010.

Rajanga.(2001). Status Of Production And Utilization Of Moringa In Southern India"(Http://Www.Moringanews.Org/Actes/Rajengam_En.Doc).Development Potential For Moringa Product(Dares Salaam, Tanzania).

SUBSISTENCE AGRICULTURE AND WELFARE STATUS OF RURAL FARMERS IN NIGERIA

By
[1]Ogunnubi C. S, [1]Abu Maliki, [2]OtoayeA. A and [3]Ojemu Ambrose Bade
[1]Department of Agricultural Technology, School of Applied Science, Auchi Polytechnic Auchi.
[2]DepartmentofAgricultural and Bio-Environmental Engineering Technology, School of Engineering Technology, Auchi Polytechnic Auchi.
[3]Departmentof Minerals and Petroleum Resources Engineering Technology, School of Engineering Technology, Auchi Polytechnic Auchi.

Abstract

Nigeria must exit its traditional methods of cultivation into modern agriculture because of immediate objectives of widespread improvement in the well being of rural household and alleviation of poverty. Agricultural production is yet at subsistence level involving the uses of crude implements and hence practices of shifting cultivation. This manifests in low income which leads to poverty. Poverty has occupational dimension and manifestation. The core poor populations are in agriculture and agricultural related occupation. A characteristic of developing country is the practice of subsistence agriculture with declining marginal productivity. Efficiency in production is grossly affected by numerous problems, low input, lack of loan facilities, rural problem, storage problems and conservative attitude of farmers. Land tame problems and weed problems. The neglect of crop production policies has resulted to government must give consistent support through subsidies, timely release of funds for farm operations. Conscious efforts to strengthen the extension service is paramount in order to disseminate information at farm gates on practicable farming techniques, create awareness about proper external input management, crop species and tolerance to environmentally induced infestations.

Introduction

Nigeria is in the process of transforming her agriculture with intention to produce food for the fast growing population and supply raw materials for the agro – allied industry. The process certainly involves the abuse of vital resources of soil and water through increased exploitation and degradation in doing so(Daramola and Aturamu, 2003).

Within the framework of government goal of ensuring widespread improvement in the well being of households and individuals, better employment of human resources is an intermediate objective and a key means to other important ends such as aggregate economic growth more equitable distribution of wealth and income increasedlabour productivity, alleviation of poverty and political stability (Awoyemi and Adekaye, 2005).

Crop production in Nigeria is determined by economic, political, institutional and climatic factors was well as the quality and quantity of natural endowment. Hitherto, rural farmers practice subsistence agriculture. Majority of Nigerian farmers still produce at subsistence level using old management practices like shifting cultivation (Daramola and Aturamu, 2003). A larger proportion of food production in developing countries is being associated with the efforts of rural dwellers. Developing countries, Nigeria inclusive, have about 70% of their populace dwelling in the rural setting and mainly engaged in agriculture (CBN, 2002). According to Aliyu (1993) over 70% of Nigerian number among the poorest and most deprived people in the country. An inventory of all efforts at defining subsistency will produce small scale farmers who live in rural area and who are poor and lack political power vis-à-vis their city dwelling counterparts. The family in that setting consists of production and consumption units (Spencer, 1998). In otherwords, subsistency is defined in terms of residentiality and econo-political status. Subsistent farmers are farm families conceptualized as a family that has agriculture as her major source of livelihood and her members are engaged in farming. Farm family spend their time on the farm working labouriously year-in-year-out and engaging in several non farm activities during the dry season (Akinbile and Ndaghy, 2005). These subsistent farmers live in the rural areas and has undoubtedly indespensible sustaining power of the entire populace in the absence of any attention. According to Akinbile and Ndaghu (2005) the country is unable to meet its needs in several agricultural produce largely because in the face of huge earnings from export, government lack the determination to improve agriculture.

The manifestation of low returns in subsitency leads to the perpetual vicious low income cycle to which Nigeria belongs (Durojaiye, 1987). According to Odigboh (1991), the average Nigerian farmer grows poorer in real and relative terms year by year.

Poverty is endemic – a condition of life that is unhealthy, unproductive, unworthy and in general so degrading so as to insult human dignity. It is the absence of means to maintain and enjoy basic needs of life. This situation manifests as deprivation and lack of access to food, money, social security/services and productive assets and makes life difficult for individual to participate in the decision that affects his/her life (Okunmade, 1999a, 1999b). In the view of Okunmadewa (1977), poverty has occupational dimension as the poor are most likely engaged in agriculture and agro-allied ventures. poverty assessment shows that 87% of the core poor in 1985 and 67% in 1997 were in agriculture and agriculture related (Canagarajah, 1998).

Occupation and all basically reside in the rural areas. According to Osuntogun, et al., (1986); it is widely accepted that majority of Nigerians live in the rural areas. Rural economics as opined by Atte (1986) are characterized by pruning production with low rates of economic growth which is unable to provide the people with means of transforming their lives through acquisition of modern artifact which indicates better living. Idaehaba et al., (1981) quoted in Atte (1986) discussed the importance such an economy and resultant vicious cycle of poverty and underdevelopment in a series of illustrations two of which are relevant.

The rural conditions of neglected rural infrastructure such as poor rural roads network, inadequate storage facilities, defective market structure conduct and performance leading to exploitation by middlemen, low farm gate crop producer price high farm gate input price, limited effectiveness of inputs, subsidies and guaranteed minimum price and high post harvest losses. These in turn lead to low farm and rural non – farm output, low rural income and rural urban income gap. The end result for the rural majority is a condition by low tax base, low capita formation and investment, mass illiteracy, inadequate rural basic needs and effective policy formation process (Elebe, 2008).

Thus, poverty is more personalized at the grass roots level in our villages (Atte, 1981). According to Aremu (2001), opines that poverty is a condition of the under privileged; Aluko (1995) as lack of certain capacities and inability to talk in the presence of the rich (Robert, 1998). Conclusively, as suggested by Pingali (1999) on the long run, subsistence agriculture may not be a viable activity to ensure sustainable household food security and welfare.

2.0 Subsistence agriculture in nigeria

Factor endowment determines the economic development of a nation including non human and human resources. However, the productive capacity of human resources is a function of how well fed they are (Omonona and Agoi, 2007). A characteristics of the developing countries agriculture is a widespread of productivity decline (Fuginito and Pervin, 1998). According to Faluso (1995) in recent years despite all the human and material resources put into agriculture in Nigeria, the rate of its productivity increase is said to be declining. Most developing countries including Nigeria are characterized by low agricultural output made obtainable through small scale farmers in rural settings.

This is evidenced in their lack of marketing and pricing policy, good storage facilities for agricultural produce, highly unpredictable weather, high incidence of pests and diseases, non – motorable roads, thereby leaving agricultural produce (though high commercial value) trapped in the rural areas, poor access to credit facilities etc. All these keep the farm families trapped in the vicious cycle of poverty. Production is in the hand of a large number of inefficient small holder farmers who are perceived to be inefficient, and characterized by low level productivity (Abdulai, 2005) who cannot perceive the onset of erosion and soil nutrient depletion pest injection etc. subsistence agriculture is due to intensive farming and inappropriate land management practices causing negative imbalance in soil nutrient. This practice intensifies erosion on agricultural land which is estimated to be 75 times greater than erosion in natural forest areas (Abdulai, 2005). According to Agboola (1968), several factors are responsible for the low crop yields among which are use of low yielding varieties, low soil fertility, low plant population per hectare, poor cultured management inadequate need control, losses from pests and diseases as such there is always shortage of food. Farmers in sub – humid tropical West Africans are faced with problems of intensification of level used, reduced fallow periods as a result of increased human population (Fadayoni*et al.,* 2005) with consequences such as soil degradation, loss of soil nutrient (Fadayoni*et al.,* 2005) and high weed pressure. In subsistent agriculture, shifting cultivation is practiced where farmers slashed down and burn the fallow vegetation, cultivate the land for a few year and then abandon the site for 5 to 7 years to allow the vegetation to regenerate and keep pest population at low levels (Fadayoni*et al.,* 2005) is no longer sustainable (Ekeleme and Chikoye, 2003). Instead, continuous cropping with little or no fallowing period is gradually replacing the age long traditional mode of farming (Fadayoni*et al.,* 2005). This has resulted in a systematic degradation of arable land and accompanying decline in the productive capacity of such land low crop yield results.

Weed infestation is yet another factor for low yield of measures to combat weeds, with hoe weeding, hand pulling fallow and crop rotation. The severity of weed infestation is more common in low input subsistence farming system. The farmer’s link it to continuous cropping due to reduction in fallow duration caused by population pressure dispersal to previously infested land and bush burning (DFID weeds project, 2002). Crops are parasitized in the tropics (Parker and Riches, 1993; Riches and Parker, 1975;Guorgnor*et al.,* 2001) causing yield losses reported to be greater than those from other diseases and pests combined (Fadayoni*et al.,* 2005). One of the greatest hurdles limiting agricultural production is the scarcity and cost of labour for farming operations which is estimated to constitute 60% of farm account (Babalola, 2002). Farmer’s children are not ready to be better farmers. In subsistence agriculture, there is dearth of physical structures such as storage and preservation facilities hence post harvested losses is heavy. Babalola (2002), estimated that 4.5% of annual cowpea produced in Nigeria is lost due to infestation and damages by storage bruchids especially callosobruchus. According to Olayemi(1994) the sector is entirely dominated by small scale resource poor farmers who produce over 90% of the country’s agricultural output with rudimentary farming implements, low capitalization and low yield per hectare. The technology of production still remains largely traditional resulting in low resources utilization and consequently low output. The inability of subsistency to keep agriculture abreast the rapid rates of population growth confronted with the threats of frequent and large scale famines, the strategies often directed at achieving short term increase in food production is to supplement the traditional methods of agriculture with modern technologies of the developed countries. The extent to which risk impedes the adoption of new technologies and slows down the rate of yield expansion in production of food crop is a recurring problems. Baket and Candler (1982) has observed that most farmers in Nigeria are often reluctant to take risks they believe that this may jeopardize their subsistence – poor farmers will not change their more stable lower return traditional techniques for risker, more profitable practices and varieties.

Marketing and pricing information transmission mechanism are inefficient. Past policies have failed at increasing agricultural productivity through increase investment in agricultural production system research. Rosemary and Akintola (2005) identified intermediaries in the marketing chain high concentration of food stuff marketing at wholesale level, as well as high erratic prices which will further depress the level of agricultural production. It is not untrue that farmers who produce more of food consume, have the least disposable income to cater for life's basic need and farmers are likely to be poor if out is low. Farmers are hardly able to grow enough to meet household needs. An appropriate mix of production efficiency, productivity as well as profitability would lead to increased food production and overall economic growth.

3.0 The efficiency concept in subsistence

The concept of efficiency in farm reserve usage is concerned with relative performance of processes in transforming given inputs into outputs. The productivity of any resource can be defined in terms of a combination of resource or individual resources used. Efficiency of resources use is the ratio of useful output to the total inputs. However, analysis of efficiency is generally associated with the possibility of farms producing a certain optimal level of output from a given bundle of resources or certain level of output at least cost.

Accordingly, efficiency of production can be measured from a production function or a profit function approach (Effiog and Idiong, 2008). Efficiency measurement has received considerable attention from both theoretical and applied economics in Nigeria. Also, efficiency measurement is important because it leads to a substantial resource savings (Bravo – Ureta and Riger, 1991). The reason behind efficiency measurement is that if farmers are not making efficient use of existing technologies, then efforts designed to improve efficiency would be more cost effective than introducing a new technology as a means of increasing output.

The efficient method of producing a product is that which uses the least amount of resources to get a given amount of the product. An increase in efficiency it enable crop production could present a ray of hope and could lead to an improvement in the welfare of the farmer and consequently a reduction in their poverty level and food security. Low yields are as a result of inefficient production techniques manifested in technical and allocative inefficiencies, over – reliance on household resources, labour intensive agricultural technology and rapidly declining soil productivity.

4.0 Problems of subsistence in nigeria

Problems in subsistency will include the followings but not limited to:

1. Lack of labour: There are no labours to work in subsistent agriculture. The situation is so bad that in Nigeria as in most Africa, the son of the farmer goes to school not to become a better farmer but to escape from the farmers world of losers and drugery (Wainaina, 1990). According to Odigboh (1976), it should be noted that farmers does not resent infact he is pleased with this loss of his children's assistance on the farm since the common most ardent ambition or hope of a Nigerian farmer is for his son to become anything but a farmer.
2. Lack of Implements: Characteristics of subsistent agriculture in Nigeria – rudimentary tools are hitherto used. Humans are not efficient sources of power and so human power output is limited by the stress of high temperature and relative humidities prevalent in the tropics. According toFAO (1981), the work rate efficiency of human is about 50% in temperate climate, the efficiency is less than 10% in humid tropical condition such as in Nigeria. His entire agricultural machinery for tillage consists of the hoe in its various forms, shapes and sizes perceived as inherited from his ancestors (Odigboh, 1982, 1983).
3. Lack of market information: There is insufficient knowledge on how crops from the producing areas arrives in the market, consuming centres, the efficiency of crop marketing system and the difficulties encountered by sellers of food crops. Qualitative information on marketing of food crops is lacking and where available outdated (Eluagu, 1990). There is no information on food crop prices. Overcoming market failure leads to subsistence farming (Brann and Kennedy, 1994). Marketing in the rainy season when all crops matures at about the same time, creates glut in the market thus leading to very low returns per hectare of crop produced during their periods (Fadayoni *et al.,* 2005). Marketing and distribution services are critical for the effective functioning of

any economy, but these are very difficult in the rural areas. Precious studies on marketing and pricing of staple food stuff in different parts of Nigeria have concluded that marketing and pricing information transmission mechanism are ineffective although there are many buyers and sellers in the market (Fadayoni*et al.,* 2005).

4. Marketing of farm produce: The subsistent farmers usually have a great variation in production costs and so they sell at different prices. Agricultural policy in Nigeria has been concentrated on increasing agricultural productivity through huge investments in agronomic and production system research neglecting pricing policy and marketing research (Okoh and Akintola, 2005).
5. Low inputs: The lack of funds to buy improved seeds and fertilizers has contributed to the decline in the use of these inputs by farmers (BWARDA, 2005). According to DFID (Weed Project, 2002) Striga infestation is more common is low input subsistence farming system that farmers link it to continuous cropping due to reduction in fallow duration caused by population pressure, dispersal to previously infected land and bush burning.
6. Lack of Loan facilities: Access to agricultural credit has been severely constrained in developing countries like Nigeria (Rahji, 2005). The subsistent farmers are financially constrained and thus do not have sufficient resources to purchase inputs and to pay for other farm operations. Weeding for instance, the only option they resort to is manual control – slashing, pulling and hoe weeding which are very tedious and practicable on small farm sizes thereby making the farmers productive capacity very low.
7. Lack of extension services: Many of the mid 20th century extension communication researchers agree that wide spread acceptance of improved farm practices require adequate information which has to be effectively disseminated so that the farmer receives the information understand it and regard it as a valid basis for action (Campbell, 1959; Rogers, 1962). It is believed that the diffusion of agricultural innovations will help distribute the benefit of new technology breakdown socio-cultural barriers and promote general economic growth (Rolling *et al.,* 1981; Gross, 1979; Abot Ella *et al.,* 1981; Alala and Voli, 1987).
8. Problems of land tenure: The system of land holding is by inheritance in subsistent agriculture. Rural women in marketing in the rainy season when all crops mature at about. The system of land holding is by inheritance in subsistence agriculture. Rural women in developing countries have been found to play prominent role in agriculture(Odigboh, 1982). However Eghugara (1996) ascerts that men are traditionally considered to be the rightful holders of land as women are not expected to own land by custom.
9. Lack of irrigation facilities: The status of the soil and water are two very important variables affecting crop growth and development (Beme, 1981). There are no irrigation facilities for the subsistent farmer and their production is at the mercy of nature. The length of dry spell in the Southern Nigeria where local rainfall is high but when for 5 – 7 days of no rainfall, plants suffer from stress and wilt (Akoroda, 1998). Greenlay (1996) reported that draught stress retards plant and fruit growth triggers blossom end not and abortion of fruit and flowers thereby reducing yield and quality of produce. High temperature have adverse effect on fruit set. Late planting results into yield reduction that crop yields generally decline with lateness of planting after an optimum time usually the start of the rains.
10. Lack of storage structures: There is scarcity of storage structures hence post harvest losses is heavy. One of the major problems faced by farmers is storage associated loss due to ineffective storage systems accounts for between 10 – 20% losses (Eluagu, 1981, Coursey, 1961). Seeds that are damaged in the store command poor market prices (Singh, 1997, Alebeck, 1996, Ogunkoya and Ofuya, 2001).
11. Lack of roads: The subsistent farmer who lacks access to credit is unavoidably faced with problems of evaluating his produce from farm to the market for sale – unmotorable roads. Accessibility has been accorded a central role in much circumstances to neglects relationship of a location to the transport system (Brian, 1981, Erwing, 1995, Atubi and Omokola, 2004). According to Eluagu (1999) most feeder roads are bad, this was partly responsible for the high transportation cost.
12. Weeds problem – Weeds have become a conspicuous symptoms of growing crisis of sustainability in agriculture in Nigeria. Crop yields have been greatly reduced due to weeds infestation. The estimated yield losses due to one species of striga (S.

hermonthica) amounts to over US $ 7 billion annually. According to IITA (1998), striga negatively affects the lives of over 100 million African people. The severity of the striga infestation is more common in low input subsistent farming system.

13. Conservative attitudes: Being called a farmer is a problem subsistent agriculture farmers are considered the least people in the society, residing in rural areas, poor and deprived. This is responsible for moral urban drift. No body want to remain in rural area, hence farming is left in the hands of the less privileged and a last resort occupation. According to IFAD (2006), poverty is more severe among rural populace who are mainly in farming. This is most worrisome as the majority of the rural dwellers are engage in food production for survival.
14. Unplanned use of land: One of the serious problems affecting agricultural productivity in the tropical and developing countries like Nigeria is the ineffective and unplanned use of agricultural land. It is necessary that every hectare of land be used according to its potential capacity. There has been a growing concern about sustainable production it implies that present agricultural production must not jeopardize future production (Odigboh, 1982).

5.0 Suggested ways improving subsistence

Man's effort can cultivate a small hecterage of land. It is important to improve the output of man's effort through the followings:

1. Credit access/grants: Government intervention should be through multiplicity of credit institutions to include agricultural credit guarantee scheme (ACGSF), specialized agricultural credit bank (e.g. Nigerian agricultural credit and rural development) and stimulating institutional innovation in the financial system (People's bank, community bank, rural banking schemes) to result in significant improvement in financial intermediation especially for agricultural purpose.
2. Provision of farm inputs – provision of farm inputs to farmers at subsidized price should be encouraged by the Federal government. Farm inputs such as fertilizers, herbicides, fungicides, insecticides and improved seed varieties. Early maturing seeds and diseases resistant crops.
3. Hiring unit – Government should put in place farm machinery hiring units to provide machinery to farmers to clear farm land and cultivate at reduced price for subsistent farming improvements and encouragements.
4. National participatory learning – These is the need to change farmer's orientation towards traditional farming through participatory learning which is key to wider adoption of integrated approach to crop production management. It empowers farmers by providing knowledge of crop yield potentials and various environmental hazards that are possibly encountered in production. The problems and soil fertility, enabling them to gain ownership of new options for more effective farm management and to take responsibilities for adopting these options to meet their own needs.
5. Establishment of community based seed multiplication units. Encourage community to establish seed multiplication sites to produce improved seeds of various grain and improved cassava cultivars with short duration periods for distribution to their members.

Conclusion

In Nigeria, as in most developing countries, agricultural production have continued to decline steadily over the years leading to increasing food insecurity and deteriorating quality of life especially among the rural populace. To increase agricultural production farmers must exit their traditional ways of farming (subsistency) into modern agriculture as a means of improving their economic status and so attaining a sustainable agriculture for food security and self sufficiency. This is important considering the population increase rate. The key to crop production optimality should be practiced – improved farm operation. However, farmers are skeptical of hybrids due to high costs of seeds and fertilizer requirement and the unavailability of inputs. Farmers tend to prefer their traditional planting materials which they can access easily at low costs.

Recommendation

Low productivity has characterized Nigerian agriculture with an overall negative effects on the economy and general well being of the farmers in particular. Farmers are likely to be poor if the output is low. The basic food crop production systems are not capable of ensuring increased and sustained productivity added to the fact that majority of the families are resource poor and tantamount to low agricultural output. It is hypothesized that a higher output will always lead to a higher income which increases the standard of living.

The neglect of formidable crop production policies formulation has resulted to low agricultural productivity and poverty. There should be consistent support by the government of the day through subsidies, delegate and timely release of funds for farm operations, maintenance and establishment of improved management structure incorporating well-articulatedparticipatory input by farmers as stake holders.

Government should make conscious efforts to strengthen the extension service adequately to enhance their abilities to disseminate information at farm gates on practicable farming techniques, create awareness about crop species and tolerance to environmentally induced infestations. To achieve sustainable agricultural production, detail map of Nigeria focused on potentially agriculturally productive areas should be complied to allow for planned sustainable intensification of agricultural production and attainment of national food security. Farmers should be taught proper external input management and good methods of post harvest activities by appropriate farm management experts.

REFERENCES

Abd – Ella, M., Eric, H. and Richard Werren (1981): Adoption behavior in family farm system: an Iowa study, rural sociology 46(1):42-61pp.

Abdulai, A. (2003) Employment creation opportunities in agro allied subsector. The case of cassava production.

Akinbile, L. A. and A. A. T. Ndaghu (2005): Poverty level and poverty alleviating strategies of farm families in MichikaLGA of Adamawa state, Nigeria. Journal of Rural Economics and Development Vol. 14 pp 101 – 108.

Akoroda, M. O. (1998) Elements of agricultural meteorology department of agronomy, University of Ibadan, Ibadan Nigeria PP 4 – 8.

Aliyu, A. (1998) "Perspective of poverty alleviation programmes in Nigeria: 1960 to 1997. A paper presented at the University of Maiduguri 5th Annual lecture Sheraton Hotel and Towers Lagos, pp 2-11

Aluko, S. (1975) Poverty: its remedies in Nigeria.Ibadan Nigeria Economic society.

Anthonio, Q. B. O. (1968) The marketing of staple food stuffs in Nigeria. A study in printing efficiency Ph.D dissertation university of London pp 98 – 167.

Anyazo, I and A. Azu (2008): Ugandan farmers marketing opportunities after conflict. Magazine of low external input and sustainable agriculture (LEISA) Vol 24, No 13, pp 20 – 21.

Aremu, J. A. (2001). The economy and poverty paper presented at National conference Kaduna Policy.

Atala, T. K and J. P. Voh (1987): Role of performance of extension agents in Kaduna state of Nigeria "Evidence from past analysis" The Nigerian Journal of rural and community development 1:25-45pp.

Atte, O. D. (1986): Overcoming rural development in Nigeria past approaches and alternative view. The quarterly journal of administration vol xx no. 314: 137 – 151.

Atubi, A. O. and P. C. Omokala (2004) The accessibility of centres to the road networks. The case of Lagos, Lagos Nigeria international journal of ecology and environmental dynamics Vol 2: 140 – 151.

Awoyemi, T. T. and T. O. Adekaiye (2005); Gender analysis of economic efficiency in cassava based farm holdings in South Western Nigeria. Journal of Rural Economics and Development Vol 14 pp 65 – 80.

Ayeni, A. O. (1991); Hand/Mechanical weed management as an option in Nigerian Agriculture. Nigerian journal of weed science 4:75 – 77 pp

Babalola, O. (2002); Nigerian agriculture for hope, hurdles against hope, hope for tomorrow 2000/2001. University lectures. University of Ibadan Nigeria

Balcet, J and Candler (1982): Farm technology adoption in Northern Nigeria Vol 1 (main report) world bank research project.

Barbier, Edward (1996): The economics of soil erosion: theory, methodology and example paper based on presentation to the fifth biannual workshop on economy and environment in south-east Asia, Singapore, November 28 – 30, 1995.

Bebanoi, F. E., Eplee, R. E., Harris, C. E. and R. S. Norris (1984); Longevity of witchseed (strigaAsiatica) seed. Weed science 32:494 – 497 pp.

Bene, J. (1981) Soil water plant relations.Ministry of Plateau state agricultural news 2(5) 12 – 13.

BNARD, (2005); Benue agricultural and rural development authority: Report on the cropped area yield surveys, planning, monitoring and evaluating department Makurdi. Pp 16

Boserup, E. (1979): The position of women in economic production and in the households with special references to Africa in presreolu C. an ssZryart (eds). The household woman and agricultural development pp 243-259.

Bravo – ureta, B. E. and Reiger L. (1991) Dairy farm efficiency measurement using stochastic frontier and Neoclassical duality. American Journal of Agricultural economics 73: 421 – 428.

Brian, G. (1987): Dictionary of Human geography. England Penguin books.

Campbell, H. L (1959); Factors related to differential use of information sources.M.ScThesis.Ames Iowa state university.

Canagarajah, S (1998); Poverty and welfare in Nigeria's (World Bank Analysis) by National planning commission of Nigeria edited by America writing corporation Washington DC pp 3 – 5.

Coursey, D. G. (1961): The magnitude and Origin of storage losses in Nigeria "Yams" L.Sc food agriculture 12(8):511-580 pp.

DFID, (2002); Weed project. Report on community workshop on striga and imperata in TarkaLGA Benue state 11 – 12 March; IITA Ibadan 14 pp

Ditloh S. (1994) Market integration: The case of dry sea vegetation in Nigeria. Issues in Africa rural development.

Durojaiye, B. O. (1987) Farmers cooperative as a strategy for increasing agricultural returns in Nigeria. Paper presented at the 2ndnationa seminar on community development university of Ibadan pp 6.

Effiong, E. O and Idiong (2008).Measurement and source of economic efficiency in rabbit production in AkwaIbomstate.A stochastic production function approach. Nigerian Agricultural Journal 39: no 1 and 2 8 – 15.

Egbugana, C. H. (1990): An analysis of role of rural women in production and processing of selected good crops in EtitiL.G.A. Imo state.An unpublished Ph.D Thesis, University of Ibadan.Pp 90-96.

Ekele, F. and D. Chikoye (2003) A survey of need flora of arable fields in the moist savanna zone of Nigeria. Journal of sustainable agriculture and environment 5(2): 228 – 240.

Elebe, M. I. (2008) Rural development in Nigeria: Bedrock of sustainable poverty alleviation. International journal of economics development issues.Vol 7 No. 1.

Eluagu, L. S. (1988): Inter and Intra state trade on root crops. A study of yam collection and distribution processes. Unpublished Ph.D Thesis, agricultural economics department, University of Nigeria Nsukka.

F.A.O. (1983): Fertilizer use under multiple cropping system, FAO fertilizer and plant nutrition bulletin No. 5 Food and Agric Organization pp 36.

Fashina A. B. and O O. Oduwole (1999); current status of Nigerian exportable agricultural commodities. Information paper presented at the workshop on focus National Export products in Nigeria. Lagos chamber of commerce and industry commerce house Victoria Island Lagos.

Greenleaf, W. A. (1986) Pepper breeding in: Breeding vegetable crops. M. J. bassey (ed) AV publishing co inc. West Port, Connecticut.

Gross, Kelvin (1979): "Consequences of diffusion innovations" Rural sociology 44(4)754-772 pp.

Holm, (1971) Weed management in small holder Rice production in the tropics File//A:/rice3.html

IITA (1998); Maize improvement programme research highlights 1981 – 1984, Ibadan Nigeria

Iken, J. E. and N. A. Amusa (2004); Maize research and production in Nigeria.African Journal of Biotechnology 3(6) 302 – 307 pp.

Jackai, L.E.N. and Doust, R. A. (1986): Insect pests of cowpea annual review of entomology 31:95-105.

Jones, W. W. (1969) Marketing of staple food crops in tropical Africa. Overall analysis and report. Stanford California pp 60 – 100.

Mencher, J. (1986): Women and agriculture. Mann C. K. and B. Huddleston (eds) Food policy frameworks for analysis and action. Academic press N.Y. pp 112-127.

Odigboh, E. U. (1916); Engineering the mechanization of Nigerian Agriculture: Sociological, economical and technological implications. Paper presented at the symposium at the university of Nigeria Nsukka, Semptember 10 – 11.

Ofuya, T. J. (2001); Biology, Ecology and Control of insect pests of stored legumes in Nigeria, pp 24 – 58, in Pests of stored cereals and pulses in Nigeria; Biology, Ecology and Control, Edited by T. J. Ofuya and NES, Lale, Dave Collins Publication Nigeria.

Ogunkoya, M. O. and T. I. Otuya (2001): Search for alternative legume hosts of callusobrunchusmaculatus in rain forest environment in Nigeria. Nigerian journal of experimental and applied biology. 4:59 – 63 pp.

Okoh, R. N. and J. O. Akintola (2005); Oligopolistic pricing and market integration of cassava roots and products in Delta and Edo state.Nigerian journal of rural economics and development vol 14 No 2 pp 21 – 46.

Okoli, R. N. and J. O. Akintola (2005); Oligopoly pricing market integration of cassava roots and products in Delta and Edo states, Nigeria.Journal of rural economics and development Vol. 14 pp 21 – 44.

Okwumadewa, F. (1998).Poverty and agricultural sector in Nigeria. Poverty incidence of farmers by region, Fos October, 1999 pp 4 – 21.

Okwumadewa, F. (1999a). Poverty and agricultural sector in Nigeria. Poverty incidence of farmers by region, Fos October, 1999 pp 4 – 21.

Olayemi, J. K. (1994) Policies and programme in Nigerian agriculture.Department of agricultural economics university of Ibadan.

Parker, C and Riches C. R. (1993): Parasitic weeds of the world. Biology and control.CAB international castel field press.KetheringNorhtcuts UK.

Parsley, G. J. and J. J. Doyle (1999) "Biotechnology for developing country agriculture: problems and opportunities. A 2020 Vision for food and agriculture and environment. International food policy research institute (IFRI), Washington D. C. pp. 1 – 3.

Pingali, P. (1999) From subsistence to commercial production system. The transformation of Asian Agriculture.

Riches, C. R. and Parker C (1993): Striga parasitic weeds of the world. Biology and control.CAB international castel field press.KetheringNorhtcuts UK.

Robert, C. (1998) rural development.Printing the last first England Addison Wesley. Longman ltd. Edinburgh

Roder, W. Phenachang S. K. (1997) Weeds in slash and burn rice field in Northern Lagos Weed research 37: 31-43.

Rogers, E. M. (1962); Communication of innovation – A cross cultural approach. The free press collier Macmillan publishing co. IncN.Y pp. 11 – 28

Rolling, Neils G, Joseph Ascroft and Fred Wa-chege (1981): The diffusion of innovation and the issue of equity in rural development in B. Crough and S. Chamata (eds). Extension education and rural development New York: H. John Wiley and Sons pp 225 – 236.

Silvio, G. A., P. Peterson; A. G. Freive and L. Silveira (2008); Addressing the conditions for getting out of poverty; LEISA. Magazine on low external input and sustained agriculture pp 6 – 7.

Singh, (1986) IITA's Cowpea research programme.Tropical grain legume bulletin. 32:10-24

Spencer, J. (1998) Peasants.In a Barnard and I .spencer Encyclopedia of social and cultural anthropology London Routledgepp 418 – 419.

Thordey, A. R. (1960) Analysis of staple food price behavior in Western Nigeria, PhD dissertation university of Illinois, Urbana pp 1 – 220.

Wainaina, S. (1990). Major agricultural reforms needed expert says: Africa farmer 3:34 Publication retrieved Nov. 14, 1996 accepted (1999)

APPLIQUÉ AS AN IMPETUS TO SELF RELIANCE - TRASH TO TREASURE

By

Kukoyi Olajumoke Temitope (Mrs.) jumokekukoyiyahoo.com 08038177297
And Ohwo Mary A. (Mrs.)

Department of Graphics/Textile School of Art & Industrial Design Auchi Polytechnic, Auchi

Abstract
In these days of global economic downturn and fiscal uncertainties, a prudent management of resources will go a long way in sustaining macro and micro economies of the society and may ultimately provide the needed shock absorber for the global economic meltdown. One of such ways of prudent management of resources is to cut down wastages in everyday life and transform them into useful applications. Discarded off-cuts in clothing processed are example of materials that are ordinarily considered as trash but which has the potentials of being transformed into useful fashion that will be treasured and earn money for the owner, hence this effort to educate on the beauty and process of appliqué as a technique of clothing. A detailed technique of Yoruba appliqué is made. Tools, method and materials for interior decoration are also not left out. This study is therefore an attempt to review, improve, appraise and popularize appliqué designs for interior decoration rather than traditional cultural purposes alone.

Introduction

As a product of traditional resource expressions, the craft of appliqué frequently provide avenue for problem solving in the vacuity of artistic styles, and have been identified as bridge head – craft for matching and contracting the confluent nature of hand and brain. According to Chatterton (1977), appliqué is the sewing of pieces of material onto a contrasting background fabric. She went further to describe appliqué as a more pictorial and fantastic craft – it can rival painting in visual effect.

For a structural craft to survive, the spatial pattern in reference should illustrate some basic principles and elements of design, which are frequently effective in total construction and pictorial renditions (Ojo, 2004). Such instantaneous experiences are derived in the construction of appliqué/patchwork technique of fabric craft production.

This paper is significant as it will create a kind of awareness and re-awakening for appliqué and give room for a link between the past and the present thereby preserving the beauty of appliqué as an old craft. Enthusiastic home makers can develop a great deal of interest in creative appliqué and make some designs and articles for their homes during their leisure time. Contemporary craft men and women can use this in the creation of creative interior decorations like bed sheet, bed cover, window blinds, dinning cover, dinning mats, wall hangings, panels, dresses, kitchen gloves, aprons etc. and this would assist them to broaden their knowledge regarding the ideas of decorating techniques they are used to. It would also help to improve on their expertise and finesse thereby boosting customer's satisfaction, providing job opportunity, alleviating poverty on the part of interior decorators and ensuring comfortable and intellectually stimulating home environment for Nigerians.

Types of Appliqué

1. Applied – Style Patch

A design consisting of a foundation onto which patches are applied in such a way that they form patterns either by their own shape or colour of the foundation material.

2. **Crazy style patchwork**

This is made up of different shapes and sizes consisting of long, uneven and straggly patches which present haphazard but attractive look.

3. **Mosaic**

This consists of fragment of materials seamed edge to edge with no seam allowance, could be said to be elementary and may not possess the finesse found in "cracy" or "applied" patchwork designs.

4. **Patchwork Quilts**

This patchwork do not seem to have been made in England until silks and printed cottons were common and cheap enough to be cut up before they were quite worn out. Thus from the end of the eighteenth century when the fashion flourished, all poorer households had quilts, with patchwork on one side, and plain colour fabric on the other side usually with the quilting stitches showing through, on the other side. The word patchwork quilt incidentally was derived from the Latin word 'culcita', which means a stuffed sack, mattress or cushion.

5. **English Patchwork**

This design could be likened to patchwork 'quilt' except that geometric shapes - triangles, squares and diamonds combined with motifs of flowers are joined in a repetitive pattern to form a surface layer. There is also a padding layer got from a plain fabric desired by the designer, the filling is usually got from wool, linen or silk, which are cut up in pieces. This design is used only when warmth is desired.

Basic Tools and Materials for Appliqué

Drawings – this can be in form or stony illustrations

Yards of fabrics, assorted scraps or swatches of fabrics (pieces of cloth), Needles/Pins, Sewing machine, Scissors/Razor, Pencil, Tracing paper, Cardboard paper, Table, Measuring tape, Fabric adhesive, Embroidery thread/sewing thread, Thumb tack and Pressing Iron.

Procedure for making Appliqué

Three known stitches commonly used in appliqué constructions are: -

i. **Straight Stitch**: - This is used to create outline and shaded areas at the edge of motifs. It conceals rough edges of patched fabric and used to pin down patches on the background surface.

ii. **Zig-Zag Stitches**: - This zigzag is useful where there are concaves and multi curve linear angles, where straight stitches cannot be helpful.

iii. **Machine Stitch**: - Sewing machine is used to make permanently the shape before it is sewn into place. When shapes are streamlined, the edges become less difficult to turn under. This method is often effective when ironing of the seam allowances are made before stitching is affected on fabric.

Procedure

Non-fray materials such as leather, soft fibers, woven fabric are easy to use for appliqué. Appliqué can be applied by hand stitching, by sewing machine and by gluing, a sewing machine supplies a surer bond and cuts the time required by at least half (Rankin, 1992). Melanie (1987), opined that the more imaginative you are with fabric, the better it will serve you. The starting point is to choose the fabric with care and to make sure that, it is quite suitable for the job.

Template

Template is the word given to the basic appliqué/patchwork shape which is to be used as a guide for cutting all the other pieces. First make a template, if the pattern isn't full size, enlarge it on a photocopy machine. Cut the enlarged image and you have a template. The motif can be in abstract, geometrical shapes, underwater, animals etc. Trace it onto tracing paper, then cut out the motif again from your template. Alternatively, is to trace the pattern onto tracing paper, then pin the uncut paper to the fabric, positioning the motif where you want it. If an appliqué design has more than one part, you will have to make a template for each separate piece.

Cutting

If you have already cut out the template, pin it to the right side of the appliqué fabric and trace around it. Remove the pattern, leaving the outlined shape and cut out shapes and design of appliqué as motifs from contrasting fabrics, put this in position of the garment or the contrasting background material and use straight stitch by hand. If you have pinned the uncut tracing paper to the fabric, cut out the motif through paper and fabric simultaneously.

Interfacing

Most appliqués look better if you add interfacing. While this is especially true of lightweight material, any appliqué looks more three -dimensional with a layer of interfacing underneath. Lay the appliqué fabric on a piece if interfacing, the template on top and cut out both layers at once. The easiest to use is iron-on (fusible) interfacing. Lay the cut appliqué on the cut interfacing and press with a hot iron to seal the two together. One can still place the right sides of the shapes together and seam round the edges leaving a small opening. Trim the small opening and turn up the shape at the back for final stitching.

Sewing

Since the motive for applying appliqué is to make a picture through extremely fastened ends, ironing could be used to effect the permanence before sewing. Place the fabric appliqué on the right side of background fabric and pin the middle of the appliqué to hold it in place. With a narrow, short zigzag stitch, sew around the edges of the appliqué using standard embroidery thread.

Finishing

Use hot iron to straighten and smoothen the appliqué, it is more suitable to press from the back. This gives a well finished look and makes the appliqué to be more presentable.

Styles and usage

Different motifs and repeat patterns can be employed for appliqué designs, some of these motifs and patterns include:-

1. African traditional motifs such as cowries, lizard, calabash, shells etc, are examples of African traditional motifs.
2. African musical instruments such as talking drum and gourd.
3. Geometrical shapes – circles/semi circles, triangles, squares, rectangles etc.
4. Fruits of different shapes and sizes.
5. Human figures both realistic and abstract.

According to Ojo (1995), the intertwining nature of appliqué and quilt are demonstrated mostly in beddings. Bed sheets and bed coverings appliquéd and or also patched and quilted are suitable for use in winter and cold weathers. They provide warmth and good health for users. In the apartments, upholsteries that are adequately padded and decorated also provide comfort for users. Quilted cushions pillow-cases and headrests that bear assorted colourful designs beautify the interior of the home.

Appliquéd wall hangings properly framed and displayed in any part of the halls and malls provide aesthetic visual enjoyment and garments sewn with appliqué decorations show some designers' touch. Between culture and interior decoration appliqué/patchwork have gone beyond hand-made crafts. Although appliqués can be stitched on by hand, a sewing machine supplies a surer bond and cuts the time required at least by half, Rankin, (1992). They have been found to match manufacturers specification in the mass-production industries, and have been adapted to feature in the lapels of footballers boots, the goalkeeper chest and knee protectors, the water life jackets, sports wears and hand gloves are now being manufactured using series of machine quilting techniques.

At the theatre, the stage blinds and costumes of actors and actresses are decorated with both patchwork and appliqué techniques, sometimes to improvise for grotesque appearances in horror plays or to provide glamour when contemporary issues are at play. Singers and performers' dresses are daily becoming symbols of identity when patchworks of fabrics are used for their costumes. The famous "Lagbaja" multifarious costumes are good examples.

In Aviation and automobile, well-padded quilt techniques are adopted in the manufacture of parachutes and aircraft roofs and seats. Car seats and padded doors, engine protectors, fire fighter suits and jackets and some diagnostic medical equipment as contained in preventive therapy, have adopted the quilt padding method in their manufacture. Home interiors, window blinds, kitchen apron and hand gloves are also good examples of patched fabric; bed sheets, bed coverings and bed time slippers are also inclusive.

Conclusion

Appliqué is an age-long craft which possesses aesthetical, cultural, historical and economic values. Men and women can be self trained to become specialists in interior decoration using the pieces of cloth and less expensive materials. Appliqué, when creatively designed will meet the basic needs of life especially in the area of a comfortable home interior for individual, thereby leading to mass production and this in turn creates job opportunity and patronage.

Recommendations

To ensure a sort of 'Renaissance' for appliqué, the following points should be considered:-

Interior decorators, craft men and women should be encouraged to acquire more knowledge in the area of creative patchwork/appliqué.

1. The use of locally made interior decoration materials which are durable, beautiful and more convenient should be adopted.
2. Mass production of household products from appliqué at affordable prices by interior decorators, craft men and women should be encouraged in other to popularize the use of appliqués/patchwork for interior decoration and perpetuate the "Historical" values of appliqué.
3. In eradicating poverty and unemployment in the society, Textile and Fashion Design Graduates should be encouraged to get themselves self employed by going into the production of Appliqués for interior decoration.

REFERENCES

Melanie, P. (1987): "Fabric Magic". London: Frances Lincoln Ltd.

Ojo, B. (2004): "Nigerian Crafts and Techniques". Nigeria Crafts Forum, Department Of Industrial Design, Federal University of Technology, Akure, Nigeria.

Chatterton, P. (1977): "Patchwork and Appliqué". New York: Dial Press.

Rankin, C. (1992): "Decorating Table Linens". Asheville: Altamont Press.

DETERMINANTS OF CAPITAL ADEQUACY IN NIGERIAN BANKING SECTOR
(A Case Study of Zenith Bank Nigeria Plc)

MUSA ABDULLAI ALIAKHUE

DEPARTMENT OF BANKING AND FINANCE
AUCHIPOLYTECHNIC, AUCHI
EMAIL: aibotseone@yahoo.com
asilethi@gmail.com
PHONE NO: 08165783354

OBOMEILE CYRIL

DEPARTMENT OF BANKING AND FINANCE
AUCHI POLYTECHNIC, AUCHI
EMAIL: cymek2003@yahoo.com
PHONE NO: 08069211489

AND

OKHUMAILE SELENA IDOWU
DEPARTMENT OF BANKING AND FINANCE
AUCHI POLYTECHNIC, AUCHI
EMAIL:selena20102004@yahoo.com
PHONE: 08032430111

Abstract

The study examined the determinants of Capital Adequacy in Nigerian Banking Sector, using Zenith Bank Nigeria Plc as our case study. To facilitate our study, data from 2004-2016 were collected and estimated using the Ordinary Least Squares (OLS) regression analysis method. It was found from the study Return on Asset and Return on Equity are significant determinants of Banks' Capital Adequacy. We therefore recommended that deposits and equity funds should be acquired at a minimum cost and get them invested in viable and positive NPV investments as they have the capacity to improve Bank Capital Adequacy.
Key words: Capital Adequacy, Liquidity Structure, Return on Assets, Return on Equity.

1.0 INTRODUCTION

Adequacy is one of the most important topics for both regulatory authorities and banks as it represents the most important element of banks stability and solidarity. In this regard, regulatory authorities have worked on introducing different measures of adequacy, the most prominent of which was the capital adequacy approved by Basel committee on Banking Supervision (2013) and applied by more than hundred countries.

Banks capital plays a very important role in maintaining safety and solidarity of banks and the security of banking systems in general as it represents the buffer gate that prevents any unexpected loss that banks might face given that banks operate in a highly uncertain environment that might lead to their exposure to various risks and losses.

Capital adequacy in the financial sector and for banks in particular is a central issue of prudential regulation. This is so because the banking publics are not in position to judge the safety and soundness of a bank or financial institution due to imperfect information and agency problems associated with the nature of financial intermediation business. Hence, capital adequacy is aimed at ensuring that the banks are financially sound.

Basel Accord as international standard of capital adequacy recognizes the ratio of capital funds to deposit and posit that a bank should have capital funds equal to at least 10% of its deposits liabilities. Conventionally, a bank statutory capital is considered as adequate if it is enough to cover customers' withdrawal needs and protect depositors against total or partial loss of deposits in the event of liquidation or losses sustained by the bank.

Onoh (2002) and Crosse and Hamsel (1980) posit that often times a bank statutory capital is considered as adequate if it is enough to cover the bank operational expenses, satisfy customers' withdrawal needs and protect depositors against total or partial loss of deposits in the event of liquidation or losses sustained by the bank.

Banks are financial intermediaries that accept deposits, make payments, offers loans, as well as wide range of other services. In doing so, they channel funds from savers to borrowers or investors thereby increasing economic efficiency by promoting better allocation of resources (funds). These demand that they have adequate capital in order to maximize the attendant financial benefits. In order to chart present and future policy paths for the banks' financial performance response to capital adequacy stimuli, it is necessary to investigate the behavior of important financial performance indicators such as return on assets, return on equity, etc. in the light of the effects of capital adequacy forces or prudential regulation that rule the banking industry.

2.0 Literature Review

Capital adequacy ratio for banking organizations is an important issue that has received a considerable attention in finance literature. Inadequate capital has lead to the sudden collapse of banks and prior to the 2005consolidation; the incessant level of bank failure was systemic and endemic in Nigeria. Challenge by this prevalent cases of bank collapse and the need for bringing about a robust banking system that is secure, safe, and transparent and guarantee depositors fund and drive economic development, several reforms agenda have taken place in the past but have not yield the desire purpose.

The Nigerian banking sector over the years was saturated with many banks that were undercapitalized, poor managerial acumen, liquidity problem, and absolute absence of confidence by the banking public and hostile competition. It is the quantum of fund which a financial institution should have and plan to maintain in order to conduct its business in a prudent manner (Kishore, 2007).

Adequate capitalization is an important veritable tool in business and it is more so in the business of using other peoples' monies such as banking services. This is pertinent because adequate capital can directly or automatically influences the amount of funds available for loans, which invariably affects the level and degree of risk absorption (John, & Oke, 2013). By extension, this might impede on the bank performance in terms of profitability and liquidity. However, a financial institutions statutory capital is only adequate to the extend for which it caters for the routine operational expenses, meet timely customers' withdrawal needs and serve as a financial shield that protect depositors and creditors against losses or in the eventual liquidation of the bank. The crux of banks maintaining a minimum adequate capital model is to evaluate the capital adequacy pattern that will aid the banks and policy makers in the formulation and implementation of strategic decisions and policies that promote economic development and enhance the securitization and profitability of banking operations.

- **Concept of Capital Adequacy**

The importance of capital regulation in the banking sector cannot be overemphasized. This is pertinent because banks capital structure remains a central issue in the determination of the soundness and safety net of any bank. It can in fact be said that the ultimate strength of a bank lies in its capital funds given its significance as a tool for meeting liabilities in a financial crisis and as a cushion for insulating a bank from the vagaries of the market adversity (Onaolapo & Adebayo, 2012).

Ebhodaghe (1996) defines capital adequacy as a situation where the adjusted capital of the bank is sufficient to absorb all losses and cover fixed assets of the bank leaving a comfortable surplus for the current operation and future expansion.

Okereke (2003) opines that capital adequacy measures the availability of sufficient capital funds to cover or protect depositors fund with banks. However, in its resilient bid to restructure the Nigerian Banking Industry to meet the global challenge, endear competition, soundness and financial stability and stem crises that have continue to permeate global banking activities, the CBN reforms were targeted at institutionalizing robust capital regulatory framework that will measure the financial strength of banks and boast their financial performance.

According to Al-Sabbagh (2004), capital adequacy is defined as a measure of bank's risk exposure. Banks risk is classified into credit risk, market risk, interest rate risk and exchange rate risk that areincluded in the calculation of capital adequacy ratio. Therefore, regulatory authorities used capital adequacy ratio as an important measure of "safety and soundness" for banks and depository institutions because they view capital as a buffer or cushion for absorbing losses.

Marcussen (2005) opined that Capital adequacy is the amount of capital that is needed by a financial institution of a country that will ensure smooth business operation and to meet the demands and banking needs and markets. Capital requirement differs from country to country but the essence isaim at maintaining a required capital level that will guarantee confidence and protect depositors fund and stem the fragility and volatility of the banking sector. However, such capital requirement should not be arbitrary determined in a manner that will stifle banking performance.

Pandey (2005) sees capital adequacy as the quantum of fund which a financial institution should have and plan to maintain in order to conduct its intermediation and investment business in a prudent manner. So, adequate capital is regarded as the amount of capital that can help banks to effectively discharge its primary function and provide the ultimate protection against insolvency arising from banking risk. Capital adequacy is conceptualized as the quantity or volume of funds (capital) that a bank maintains or planning to have in order to ease and facilitate its business operations and activities effectively and protect the bank against insolvency and failure. However, solvency is the ability of a bank to repay its obligations ultimately while liquidity is the ability of a bank to pay its obligations when they fall due (Casu, Girardone & Molyneux, 2006).

Akintoye and Somoye (2008) opine that adequate capital represent the least amount necessary to inspire and sustain confidence in the banks, keep it open and operating so that time and earning can absorb losses without liquidation and enable the banking industry to take full advantage of its profitable growth opportunities. According to CAMEL approach to evaluating capital adequacy of banks and determining their soundness and safeness, the ratio of shareholders' fund to total Asset are cardinals (Gunsel, 2007). This ratio is a measure of the financial strength of a bank and reflects or represents the ability of the bank to absorb the unanticipated losses. This ratio is purported to have positive relationship with the sound financial performance of banks. This suggests that, for banks to perform its intermediation and investment function optimally, the financial performance must learn to react or respond appropriately to the dictates of its capital adequacy measures.

Oladejo and Oladipupo (2011) opine that Capital adequacy is regarded as the amount of capital that can effectively discharge the primary function of preventing banking industries failure by absorbing losses.

Onaolapo and Adebayo (2012) stress that capital adequacy management among its other significances is designed to provide cushion for absorbing operational losses; afford some measure of shareholders' confidence and reveals the bank's ability to finance its capital project as well as ensure some level of protection for depositors. It is a strategic measure aim at stabilizing the financial health operation of banks against the prevailing incidence of sectoral distress in the banking industry. Capital adequacy is practically aimed at curtailing the eminent distress and collapse of banks as a result of managerial and capital inadequacies that greeted the Nigerian banking sector before and after the banking sector consolidation exercise of 2005.Capital adequacy measure the financial strength of a bank, usually express as a ratio of shareholders' fund to total assets (Kolade, 2012).

John and Oke (2013) mentioned that capital adequacy is a conception that results from the idea of rearranging the existing capital structure of banks in order to restructure the banking industry against widespread distress. Adequate capital is the life wire of any business and creates better standard for any business establishment. A better management of capital is a sine qua non for effective bank performance in terms of meeting the operational dynamics, diversification and strategically position the bank for effective and efficient performance.

Capital Adequacy and the Basel Accord

The Basel capital accord (also known as BASEL 1), the current international framework for capital adequacy, was adopted in 1988 by a group of central bank and other national supervisory authorities, working through the Basel committee on banking supervision. The primary aim was to enhance the soundness and stability of global banking practices and guarantee equal participation and competition among banks. The capital adequacy standard of the Bank for International Settlement (BIS) stipulates that banks must maintain a minimum capital that is equal to 8% of its assets. It views capital adequacy as a veritable means of evaluating the strength, weakness and the future prospects of the equity net worth of banks by way of earnings and profitability. Worried with the spate of banking system globally and in a clear bid to enhance the performance of banks, the Basel framework requires that banks have available as regulatory capital (equity, loan-loss reserves, subordinated debt and other acceptable bank instruments) of at least 8% of the value of its risk-weighted assets (loans and securities) and assets equivalent off-balance sheet exposures such as loans commitments, standby letters of credit, obligations on derivatives contracts (FRB 2003). In determining the bank's assets, different types of assets of the bank are weighted based on their risk elements and the off-balance sheet exposures are readily converted to its equivalent value of asset and weighted according to the type of asset. Notably, while banks commercial loans are weighted at 100% owing to the risk factors, housing loan is weighted at 50% because they are less risky.

In determining the minimum capital that is required by banks to function effectively and meet its primary role of financial intermediation, the bank's total risk weighted assets are multiplied by the 8% (Basel Committee on Bank Supervision, 2013). The Basel Accord has hitherto witnessed several amendments with the recent been Basel 111 approve in January 2013 with the focus of strengthening the regulatory capital framework for large, internationally active banking organizations through minimum banking requirement that are more sensitive to an institution's risk profile and that reinforce incentives for strong risk management. Basel III comprises of a new set of comprehensive reforms measures (particularly as it relates to banks liquidity and capital) strategically advanced by the Basel Committee on the supervision of banks, to strengthen the supervisory framework, regulation and risk management of the banking industry. Basel III is predicated on liquidity coverage ratio and liquidity risk monitoring tools which are geared towards improving the banking sector's ability to absorb shocks arising from financial and economic distress improve risk management and governance and strengthen banks' transparency and disclosures. According to FRB, 2003 the major objective of the reforms is;

1 To improve risk measurement and management.

2 To increase the transparency of bank risk taking to the customer and counterparties that ultimately funds and hence share these risk positions.

3 To link, to the extent possible, the amount of required capital to the risk taken.

4 To further focus the supervisor-bank dialogue on the measurement and management and connection between risk and capital.

The Nigerian banking sector since inceptions, have witness several regulatory imperatives by the regulatory agencies on the review of the minimum capital requirement by banks. In line with the Basel Accord quest for the promotion of financial stability and soundness of banks, the CBN have progressively increase the minimum capital of indigenous bank and expatriate banks from 25,000 and 200,000 respectively in 1952 to 600,000 and 1,050,000 in 1962 (Basel Committee on Bank Supervision, 2013)

John and Oke (2013) state that the minimum paid-up capital of banks before 1991 was ₦20 million and by the provision of section 9(2) of Bank and Other Financial Institution Degree (BOFID), the minimum start-up capital rose to ₦50 million, and in the 1997 budget it was increased to ₦500 million for both merchant and commercial banks. The consolidation of the banking industry by the CBN during Professor Soludo Chukwuma in 2004 increase the minimum capital base of deposit money banks from ₦2 billion to ₦25 billion. This was done pertinent to the prevalent rate of bank distress, financial instability and the economic need to strategically reposition the financial sector (banks) to be sound, robust and active financial warehouse that will drive economic development and growth in the Nigerian economy and global arena. Presently, major world develops and developing economies have implemented the Basle Accord including Nigeria. By policy implication, it is germane to enunciate unequivocally that the Basle Accord has greater impact on the historic aspect of banking sector recapitalization and consolidation reforms in Nigeria.

- **Empirical Review**

Determinants of capital adequacy have been examined in various economies and this study finds it necessary to re-examine the factors in Nigeria's economy.

Al-sabbagh (2004) examines capital adequacy determinants in Jordanian banks and found that most Jordanian banks had adhered to the required Basel I capital accord minimum 8% capital ratio and also revealed that CAR was directly affected by ROA, loan to assets ratio, risky assets ratio and dividends payout ratio of the bank while deposits assets ratio, loan provision ratio and size of bank negatively affect CAR.

Naceur, and Kandil (2006) Studied the Impact of Capital Requirements on Bank Performance: The Case of Egypt. The study investigates the effects of capital regulations on cost of intermediation and profitability of Egyptian banking industry. Using a sample of 28 banks consolidated financial statements and micro finance data from World Bank Indicators (WDI) between the 1989 to 2004 period, the study employ two alternative measures of cost intermediation variable and profitability variable. The profitability variables use Return on Assets (ROA) and Return on Equity (ROE) while cost of intermediation uses the ratio of Net Interest revenue over average interest-bearing assets (NIM1) and the ratio of net interest income over average total assets (NIM2). The study analyzes cross-sectional and time series data using cross-section and panel data estimatorsand then present the Generalized Method of Moments (GMM) estimator. Finding indicates that capital adequacy variable (capital/assets) has a positive and significant effect on return on assets.

Vyas, Singh, and Yadav (2008) The impact of capital adequacy requirements on performance of scheduled commercial banks. The study compares the performance measured in terms of Return on Assets (ROA) of public sector banks and Indian private banks with foreign banks operating in India and Capital to Risk Weighted Assets Ratio (CRAR), Non-Interest Income (NII) and Net Interest Margin (NIM). The study scope is on schedule commercial Banks in India (excluding Regional Rural Banks) over the period 1997-2007. Using the Least Square Dummy Variable (LSDV) model, findings indicate that capital adequacy ratio increases the profitability of scheduled commercial banks in India. This support other studies findings that adequate capitalized banks face low cost of going bankruptcy. The findings also suggest that in a market driven economy,the studied schedule commercial banks net interest margin is under pressure and have to devise other sources of income to remain relevant in the market. The study recommends that banks should enhance customer's confidence by maintaining (retaining) and increasing the Capital Risk Weighted Assets Ratio (CRAR) to the minimum of 9 percent as prescribed by RBI. This is because maintaining adequate level of CRAR reduces the risk of depositors (Vyas, Singh, and Yadav, 2008)

Mathuwa (2009) study capital adequacy, cost Income Ratio and performance of commercial banks in Kenya using return on assets and return on equity as proxies for banks profitability for the period 1998 to 2007. The study uses a selected sample of 41 licensed commercial banks in Kenya. The study employ different financial ratios and statistical tools including percentages, averages, trend analysis, regression, correlation and the significant test using Minitab Software in analyzing and interpreting the data for the study. The study finds out that the non-risk weighted capital adequacy measure (i.e. the equity capital ratio) is negatively related with the profitability of the bank (as measured by both ROA and ROE) while there is a positive relationship between the risk-adjusted capital adequacy measure (i.e. tier 1risk-based capital ratio and core capital ratio) and bank profitability (as measured by both ROA and ROE). Another major findings is that CIR is negatively related to both performance measures and recommend that commercial banks in Kenya should strive to keep CIR at a minimum level, if possible below 50% threshold for them to be more efficient and globally competitive.

Ranga (2012) examined the Impact of the Minimum Capital Requirements on Commercial Banks Performance in Zimbabwe. The study uses descriptive correlation method augmented by some regression analysis to determine the magnitude of effect of capital on performance of selected banks using twenty senior bank executives as the population of the study. Findings reveal that there is significant and positive relationship between commercial banks capitalization and its performance. The study recommends that the basis for capital to be held by bank should be in line with the risk a bank is expose to, hence, the higher the risk profiles of a bank the larger the capital base should be.

Dreca (2013) using OLS regression, evaluates this subject matter in Bosnian banks and found that loan, ROA, deposit, size, ROE and leverage significantly influence capital adequacy ratio while loan loss ratio and net interest margin were insignificant.

Ragnar, Kethi and Maureen (2013) examined the Role of Capital Requirements on Bank Competition and Stability: The Case of Kenyan Banking Industry. The study investigates the role of capital requirements on banks competition and stability in Kenyan for 2000-2011 periods. The study estimates the fixed effects panel regression model for the 36 commercial banks operating in the Kenyan banking industry using Lerner Index and Panzar and Rosse H Statistics as a measure of competition. The study use return on equity to capture bank performance and stability and the estimation result shows a positive relationship supporting the evidence that capital regulation improves the overall financial stability and performance of banks. Findings from the study also indicate that the panel estimates show significant non-linear effect of core capital on competition. The log of core capital is positive and significant while squared log of core capital is negative and significant. This however means that an increase in core capital reduces competition up to a point and then increases competition indicating that the benefits of increasing capital requirements on competiveness will yield benefits once banking sector consolidation start.

In Nigeria, Okafor, Ikechukwu and Adebimpe (2010) study the effect of capital adequacy on Banks' performance. The study analyses the impact of banks capital adequacy on earnings and profitability of banks in Nigeria using panel data of sample 10 strong and 10 weak banks between 2000 -2003 periods. The study uses Least Square Dummy Variables (LSDV) model to estimates the variables. Findings show that bank earnings is invariants to factors such as bank assets and bank size but highly driven by liquidity and capital adequacy. They recommend that the consolidation of bank's capital base was right and suggest more robust and strategic regulatory framework in the effective management of liquidity and bank capital base to shore-up bank performance in Nigeria.

Oladejo and Oladipupo (2011) studied capital regulation and the performance of the Nigerian banks: need for review. The study adopts majorly an exploratory methodology and literature review approach by collecting the opinions of erudite scholars and current upsurge in banks performance (liquidity and profitability) to review the implication of capital regulations on the performance of Nigerian banking sector with a view to find solutions to the problem. The study finds that though reforms of the banking sector are necessary, there is a limit to the regulation as it relates to capital adequacy. The study finally argued that the consolidation of the banking sector by pegging minimum recapitalization regulatory requirement may bring about serious problems that may marthe essence of the reforms if not adequately harnessed.

Williams (2011) examines the impact of the macro-economic variables on capital base in Nigerian banks and discovers that macro-economic variables such as inflation, real exchange rate, return on investment, money supply and political stability are the robust predictors of capital adequacy. He concludes that Inflation has negative relationship with bank capital base and political instability also impedes financial health and stability in Nigeria which is the situation of Nigerian Banking sector of today.

Sampson, Harley and Apollos (2012) studied empirical analysis of capital adequacy in the banking sub-sector of the Nigerian economy. The study evaluates the effect of bank capital base and macro-economic variables during 1980-2010 periods. They employ the use of Error Correction Model (ECM) and Co-integration techniques to analyze the relationship between bank capital base and macro-economic variables. Findings indicate that there is a negative relationship between inflation and bank capital base as inflation erode banks capital in most developing economy. The study recommends that government should regulate investment policy while banking institutions should strive to maintain low rate of inflation possibly at 5% to make them function efficiently and compete globally.

John and Oke (2013) investigate the impact of capital adequacy standards, Basel Accord on the performance of the Nigerians Banks from 2003-2007. The study applied Ordinary Least Square (OLS) estimation technique to examine and determine the impact of the independent variables-loans and advances, total assets, customers' deposits and shareholders' funds on the dependent Variables-Earnings per share (EPS) and profit after tax (PAT). The study result showed that capital adequacy standards exert a major influence on bank performance and thus recommend that the CBN should not only lay emphasis on banks' capitalization as a determinant of banks performance, but should rather concentrate on efficient and effective bank management supervision and evolve strategies for effective examination and control of banks.

Abba, Zachariah and Inyang (2013)in their study titled "Capital Adequacy Ratio and Banking Risks in the Nigeria Money Deposit Banks" empirically examined the relationship between capital adequacy and banking risk. A sample of twelve banks out of twenty banks in the Nigeria banking Industry was studied from 2007-2011 periods. The study employs multiple regression, serial correlation and multicollinearity based on Durbin Watson result to analyze data. It also adopts value to risk to estimate capital adequacy ratio of banks. This means when risk level rises, capital adequacy ratio falls in the Nigeria banking Industry. The study recommends that banks in Nigeria should adopt a risk based approach in the management of capital instead of using paid-up capital and retained earnings as currently practice, hence there is a significant relationship between capital adequacy ratio and banks risks. It also recommends that banks should adopt pragmatic approach as increase in deposits does not necessary result in increase in capital adequacy ratio so as to guarantee the safety and security of depositor's fund.

Ikpefan (2013) study Capital Adequacy Management and Performance in the Nigerian Commercial Bank. The study examines the extent to which bank capital adequacy ratios impact on bank performance and investigate the extent to which operational expenses impacted on return on capital between 1986-2006. The study uses cross sectional and time series data obtain from the Central Bank of Nigeria (CBN), financial statement and annual reports of the sample banks. Using ordinary least square regression method to analyze the formulated models, findings indicates that the ratio of shareholders' fund/Total Assets (SHF/TA) which measure capital adequacy of banks has negative impact on the return on assets (ROA). Also, management efficiency measured by operating expenses is negatively related to return on capital. The study recommends that adequate shareholders fund can serve as a stimulant in enhancing the performance of commercial banks operations in Nigeria and build customers' confidence.

Lastly, Asikhia and Sokefun (2013) study Capital Adequacy and Banks' Profitability: Empirical Evidence from Nigeria. The study investigates the impact of capital adequacy on banks profitability of domestic and foreign banks in Nigeria. It combines the use of a sample of f 518 questionnaires administered to bank staff with a response rate of 76% basically to obtain primary data and published financial reports of studied banks betweenthe 2006 to 2010 periods. The study use survey design in line with cross-sectional research design. It also uses linear regression to analyze the primary data and panel data to analyze the secondary data of the study. The result of the primary data analyze shows a non-significant relationship while the secondary data analyzed revealed a positive and significant relationship between capital adequacy and profitability of banks. This simplymeans that capital adequacy is important in the determination of banks profitability in the Nigerian commercial banks. Findings also revealed that capitalization and profitability are indicators of bank risk management efficiency and cushion against losses not covered by current earnings. The study recommends that the regulatory authorities should ensure the sustainability of the gains of banking sector reforms. They recommend further thatmore risk management framework should be drawn as this will have positive effect on banks profitability in the Nigerian banking industry.

3.0 METHODOLOGY

The research design adopted for this study is the quantitative research design which falls under the positivist paradigm and deductive approach. The study covers the Nigerian banking sector, with special attention on Zenith Bank Plc from 2004 to 2016, which is a period of thirteen (13) years. Data were sourced from annual reports and accounts of Zenith Bank Plc for various years. Since we are using time series data, the Ordinary Least Squares (OLS) regression method was used for our analysis. The statistical analysis package that was used is the E-Views 7.0.

- **Model Specification**

In specifying the relationship between capital adequacy and its determinants, the study adopted the model built by Dreca (2013) with some modifications. Thus, the functional relationship between the dependent and independent variables is expressed as following:

BCA = F (DEP, LIQ, ROA, ROE) ……………………………1

The model to be estimated is specified thus:

$BCA_t = \beta_0 + \beta_1 DEP_t + \beta_2 LIQ_t + \beta_3 ROAt + \beta_4 ROE_t + \mu$............2
Where;
BCA = Bank Capital Adequacy
DEP = Deposit Structure
LIQ= Liquidity Structure
ROA= Return on Assets
ROE= Return on Equity
U = Stochastic variable or the error term

➢ **Operationalization of Variables**

Bank capital adequacy (BCA) is measured as ratio of total equity to total asset; Return on Assets (ROA) and Return on Equity (ROE) are measures of profitability and are calculated by dividing profit after tax by total assets and owner's equity respectively; Deposit structure (DEP) is measured as total deposit to total asset and Banks' liquidity (LIQ) is measured as the ratio of total loans to total deposit.

4.0 PRESENTATION AND ANALYSIS OF RESULTS

Dependent variable	**Independent variables**	**Coefficient**	**Std. Error**	**t-statistic**	**Prob.**
BCA	C	17.01936	3.819146	4.456327	0.0210
	DEP	0.070233	0.046022	1.526055	0.2244
	LIQ	-0.024599	0.024422	-1.007254	0.3880
	ROA	4.942364	0.724732	6.819570	0.0065
	ROE	-1038862	0.124131	-8369076	0.0036
	R^2	0.993436	F-statistic	90.80166	
	Adjusted R^2	0.982495	Prob(F-stat)	0.0001795	
	Durbin-Watson	1.89			

Source: Eviews data analysis, 2017

An examination of the regression result reveals that about 99.3% of the systematic variations in Bank capital adequacy (BCA) were explained by the regressors. While the remaining 0.7% systematic variations was left unexplained by the model and this is captured by the error term. After adjusting for the degree of freedom the model explains about 98.2% of the total systematic variation in the dependent variable as shown by the adjusted R^2.
On the basis of the overall significance of the model as shown by the F-statistics, it was observed that the overall model was statistically significant since the calculated F-value of 90.802 was greater than the critical f-value at 5% level of significance. Thus, all the explanatory variables jointly have a significant impact in determining bank capital adequacy and the existence of the hypothesis of a significant relationship between the dependent variable and all the independent variables is validated.
On the basis of the individual statistical significance of the model as shown by the t-ratios, the result shows that only one of the explanatory variable i.e. return on asset (ROA) has a significant positive relationship with bank capital adequacy since its calculated t-values is greater than the critical t-value at 5% level of significance. Also, return on equity (ROE) has a significant and negative relationship with bank capital adequacy since its calculated t-value is greater than the critical t-value at 5% level of significance. Deposit structure (DEP) and liquidity structure (LIQ) have no significant impact on bank capital adequacy.
The result also reveals that two of the explanatory variables return on asset (ROA) and deposit structure (DEP) have the expected positive sign, while the coefficients of liquidity structure and return on equity were wrongly signed. The coefficient of deposit structure of 0.070233 indicate that a unit increase in DEP will bring about 0.070233-unit increase in bank capital adequacy.

The coefficient of liquidity structure of -0.024599 signifies that a unit increase in LIQ will lead to 0.024599-unit decrease in bank capital adequacy. The coefficients of return on asset of 4.942364 suggest that a unit increase in ROA will lead to 4.942364-unit increase in bank capital adequacy. Lastly, the coefficient of return on equity of -1.038862 shows that a unit increase in ROE will bring about 1.038862-unit decrease in bank capital adequacy.

The Durbin-Watson statistic of 1.89 which is approximately 2.0 shows the absence of autocorrelation in the model.

5.0 CONCLUSION AND RECOMMENDATIONS

The Nigerian banking sector over the years have been characterized by incessant systemic distress, instability and outright collapse and failures. This however has necessitated various reforms in the Nigerian banking industry, especially the persistent upward review of bank capital base. The adequacy of this capital for its absorption and to stimulate better financial performance of banks has been an issue of controversy.On this note, the study empirically investigated factors that determines capital adequacy in Nigeria from 2004-2016. In carrying out this research a model was built and it captured variables like; deposit structure, liquidity structure, return on asset and return on equity. The study reveals the existence of;

1. Non-significant relationship between capital adequacy and deposit structure.
2. Non-significant relationship between capital adequacy and liquidity structure.
3. A positive correlation and a direct significant relationship between capital adequacy and return on asset
4. A negative and significant correlation between capital adequacy and return on equity.

Recommendation

1. Deposits and equity funds should be acquired at a minimum cost and get them invested in viable and positive NPV investments.
2 Report of financial statements and data should include rules and basis on which capital adequacy measurement is based as this will enhance banks competitive positions with regional and international banks.
3 Nigerian banks should adopt a risk-based approach in managing capital instead of the present practice of focusing on the paid-up capital and retained earnings.
4 Nigerian banks should adopt pragmatic approaches to guarantee the safety of depositors money since increase in deposits does not necessarily result to increase in capital adequacy ratio.
5 The apex regulatory financial institution should be guided by the level of deposits addition to other macro-economic indices in fixing the minimum required capital adequacy ratio for banks.
6. Loan terms and repayment should be strictly monitored and scrutinized by the manager in charge of loans.
7 There must be adequate collateral tendered by the clients and the credit worthiness of these customers must be thoroughly ascertained before granting bank loans.

REFERENCES

Abba, G., Zackariah, P. & Inyang, E. (2013). Capital adequacy ratio and banking risks in the Nigeria money deposit banks". *Research Journal of Finance and Accounting. ISSN 2222-2847*, Vol. 4, No. 17.

Al-Sabbagh, N. (2004). Determinants of capital adequacy ratio in Jordanian Banks. *Journal of Monetary Economics*, *32*(1), 513-542.

Asikhia, O. & Sokefun, A. (2013). Capital adequacy and banks' profitability: Empirical evidence from Nigeria, *American International Journal of Contemporary Research*. Vol. 3, No. 10, October.

Basle Committee on Banking Supervision (2013). *International Regulatory Framework for Banks (Basel III). Liquidity coverage ratio and risk monitoring tools,* January.

Casu, B., Girardone, C. & Molyneux, P. (2006). *Introduction to Banking,* Prentice Hall, London.

Crosse, H.D.,& Hamsel, G.H. (1980). *Management Policies for Commercial Banks*, Banker's Publishing Company. Boston.

Dreca, N. (2013). Determinants of Capital Adequacy Ratio in Selected Bosnian Banks. *Dumlupınar ÜniversitesiSosyal Bilimler Dergisi EYİ*, *12*(1), 149-162. Retrieved from.https://birimler.dpu.edu.tr/app/views/panel/ckfinder/userfiles/17/files/DERG /EYZELSAYI/11(1).pdf

Ebhodaghe, J. U. (1996). The impact of failed banks on the Nigerian economy. *NDIC Quarterly Reports*, *6*(1&2).

Gunsel, N. (2007). Financial ratios and probabilistic predictions of banks failures in North Cyprus, *European Journal of Scientific Research*. Sep, Vol. 18 Issues 2, pp. 191-200.

Ikpefan, O.A. (2013). Capital adequacy management and performance in the Nigerian commercial bank, *African Journal of Business Management*, Vol.7, No.30, pp 2938-2950.

John, E.E. & Oke, M.O, (2013). Capital adequacy standard, basel accord and bank performance: The Nigerian experience (A case study of selected banks in Nigeria), *Asian Economic and Financial Review*, Vol. 3, No. 2, pp. 146-159.

Kishore, R. M. (2007). *Taxmann financial management.* New Dehli: Taxmann Allied services Ltd.

Kolade, S.A. (2012). A comparative performance of the Nigerian banking sector in the post-2005 consolidation: through the CAMEL rating system, *International Journal of Business and Social Science*, Vol. 3, No 13, July.

Marcusse, M. (2005). Central Bank on the move, *Journal of Europeans Public Policy,* Vol. 12, No.5, pp. 903-23.

Mathuwa, D.M. (2009). Capital Adequacy, Cost-Income Ratio and the Performance of Commercial Banks: The Kenyan Scenario. *The International Journal of Applied Economics and Finance*, Vol. 3, No. 2, pp. 35-47

Naceur, S.B. & Kandil, M (2006). The impact of capital requirements on banks performance: The case of Egypt. *International Monetary Fund, IMF Institute* 700 19th Street, Washington DC, 20413.

Okafor, C., Ikechukwu & Adebimpe, U.(2010). The effect of capital adequacy on banks' performance: Evidence from Nigeria. *Journal of Business Research,* Vol. 4 No. 1-2.

Okereke, E.J. (2003). *Banking in Nigeria: Practice and Management*. Vine Books Jeso International Publishers. Imo State.

Oladejo, M.O. & Oladipupo, A.U. (2011). Capital regulation and the performance of Nigerian banks: Need for review, *Scholar link Research Institute Journals*.

Onaolapo, A.A & Adebayo, E.O. (2012). Effect of capital adequacy on the profitability of the Nigerian banking sector, *Journal of Money, Investment and Banking*. Euro Journal Publishing Inc.

Onoh, J.K. (2002). *Dynamics of Money, Banking and Finance in Nigeria-An Emerging Market*. Astra Meridian Publishers, Lagos.

Pandey, I.M. (2005). Financial Management, Vikas Publishing House Ltd, New Delhi, pp. 517-552.

Ragnar, G., Kethi, N & Maureen, T.O. (2013). The role of capital requirements on banks competition and stability: The case of Kenyan banking industry, *KBA Centre for Research and Financial Markets andPolicy. Working Paper Series* 5. WPS/02/13.

Ranga, M. (2012). An Analysis of the Impact of Minimum Capital Requirements on Commercial Bank Performance in Zimbabwe, *IJIRS Indexing and Abstracting: Ulrich's-Global Serials Directory*.

Sampson, O., Harley, T. & Apollos, E. (2012). An empirical analysis of capital adequacy in the banking subsector of the Nigerian economy, *International Journal of Economics and Finance*, ISSN 1916-9728,Vol. 4, No. 5 May.

Vyas, R.K., Singh, M. & Yadav, R. (2008). The impact of capital adequacy requirements on performance of scheduled commercial banks, *Asia-Pacific Business Review*.

Williams, H. T. (2011). Determinants of capital adequacy in the Banking Sub-Sector of the Nigeria Economy: Efficacy of Camels: A Model Specification with Co-Integration Analysis. *International Journal of Academic Research in Business and Social Sciences,1*(3), 233-248. http://dx.doi.org/10.6007/ijarbss.v1i2.36

THE IMPORTANCE OF MARKETING TO THE ECONOMIC DEVELOPMENT OF NIGERIA

Asore E.P (Mrs.) Marketing Department

Abstract

Marketing as a discipline, has played an important role in the development of industrialized nations. Until recently, however, its potential as a source of development in the third world has been largely ignored. The importance of economic development is to improve the quality of life of citizens involving and via job creation, higher incomes, improved technology, better education, higher standard of living better nutrition, cleaner environments, more equality and opportunities, and a richer cultural life. Marketing which is saddled with the responsibility of the creation and delivery of a standard of living, fortunately, is able to make the above happen. The objective of this paper is to show the importance of marketing to the development of a nation, by showing the important roles marketing plays in almost every sector of a nation's development. Methodologically, this is a review paper. The findings from previous academic journals and newspaper publications are what the paper hinges on. The paper recommends the enhancement of marketing as a discipline in all secondary and tertiary educational institutions in Nigeria, as has already been done in Edo state amongst secondary students Small scale business men and women should be encouraged to embrace marketing education since an economy's development is determined by the rate of growth of its businesses, and marketing is the life blood of every business.

Key Words: Marketing, Economic growth, Economic development, Digital and social media tools, Tourism, Entrepreneurship, and Politics.

Introduction

Marketing plays a vital role in economic growth in the present world (Kiranvoleti, 2016). It ensures planned economic growth in the developing economy where the scarcity of goods, services, ideas and excessive unemployment, has held sway. Marketing efforts are needed for mobilization of economic resources, for additional production of ideas, goods and services, resulting in greater employment. Marketing stimulates the aggregate demand thereby enlarging the size of the market.

Marketing in basic industries (agriculture, mining and manufacturing), which are the backbone of economic growth; helps in the distribution of output without which there is no possibility of mobilization of goods and services which is the key point for economic growth. It also accelerates the process of monetizing the economy which in turn facilitates the transfer of investible resources (Mack, 2015). In Export trade and tourism, marketing plays a prominent role by earning foreign exchange for the country.

Nowadays economic and social changes are necessary for bringing about the development of a nation, and social changes are brought about in a planned manner through social marketing. With the rapid growth in marketing business, technology is playing a more important role in the gathering, analyzing, and utilizing the large scale information needed from customers, in the areas of e-commerce, internet marketing of goods and services, and so on.

The end result will be the maximization of growth of the economy in order to provide a higher standard of living for all. The development of an economic level of the people that fosters entrepreneurial ability and man power training and development will also be very visible.

The Objective of the Paper

The objective of this paper is to show the importance of Marketing in the economic growth and development of Nigeria. The writer has done this using the various sectors of an economy to show how widely marketing activities really cover the economy.

Method of Writing

The writer has attempted to adopt an analytical and exploratory approach. The method adopted is analytical in that it seeks to understand the meaning and basic functioning of Marketing and its contributions to economic growth and development in Nigeria.

Conceptual Clarification

The conceptual clarification will cover the concepts of economic development, economic growth, and marketing**.** These will be used operationally and conceptually.

Economic development is the process by which a nation improves the economic, political, and social wellbeing of its people. The term has been used frequently by economists, politicians and others in the 20th and 21st centuries. Modernization, westernization and especially industrialization are other terms people have used while discussing economic development. It indicates an increase in citizens' quality of life and is often measured using the human development index. Economic development has a direct relationship with the environment and environmental issues like resource depletion and pollution (Coxhead, 2017).

Economic growth is a narrower concept than economic development and its determinants are human resources, increased specialization of labour, natural resources, capital formation, technological development, and political and social factors. It is an increase in a country's real level of national output which can be caused by an increase in the quality of resources (like education), increase in the quantity of resources and improvements in technology, or in another way, an increase in the value of goods and services produced by every sector of the economy. Economic growth can be measured by an increase in the country's GDP (Gross Domestic Product).It is measured in the value of goods and services not quantity (Amadeo, 2017).

Marketing is a social science discipline that attempts to identify customers' needs and wants and how to satisfy same. It is said to be eclectic and interdisciplinary as it draws from all spheres of knowledge. The word 'marketing' has been variously defined by various scholars and practitioners of marketing. Some scholars have looked at marketing as selling. Some other scholars have also erroneously looked at marketing as a market place. For such scholars or school of thought, as soon as you mention marketing, their minds go to the word "market"; Marketing is much more than selling and market.

Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large (AMA, 2013).It is a business process by which products are matched with markets and through which transfer of ownership is effected. This more modern definition of Marketing looks at it as the set of activities by which demand structure for goods, ideas and services is managed in order to facilitate the exchange process satisfactorily. It is a descriptive science that involves the study of how transactions are created, stimulated, facilitated and valued. The continuous dynamism in a changing world economic situation has prompted marketers to search for solutions to problems created by those economic changes. In solving such problems, the marketers, governments, and business operators must take into cognizance corporate objective, customer satisfaction and social responsibility.

An apt way to expose the linkage of marketing to development will be to refer to Onah (2007) who once established that, when we ask the question, why do we always start any business discourse with marketing and sales management? The logical answer that should readily come to mind is that "every business is marketing". This being the case, it means that every business starts and ends with marketing. When Adam smith (1776) wrote that consumption is the sole and purpose of production, he was talking about marketing.

The point therefore becomes clear that, it is business activities and their levels that determine the level of development in any given community, region or nation at large. The picture will be made clearer with a look at how marketing plays various roles to contribute in various ways to the development of a given nation, in this case, Nigeria.

Importance of Marketing to National Development

Drucker (1958) underlined the importance of marketing in developing countries because it is capable of answering the critical need. It is a common knowledge that in most developing countries the government and its allied public enterprises own a major portion of the productive sector of the economy. Often, governments make policies which prove counterproductive to the marketing efforts of individual firms. It is therefore, essential that the governments understand marketing and its implications to further their aim at national development.

The role of marketing is incomplete without giving adequate importance to the overall field of management. Implementation of good marketing ideas requires good management. The following conditions should be met before any government embarks on a marketing approach: (a) Recognizing that marketing and management are professional disciplines; and (b) Recognizing that in organizing different governmental operations, deliberate screening of candidates for their competence in the field of management is essential.

Marketing and Basic Industries Development: Agriculture, Mining, and Manufacturing.

Agriculture is the backbone of any economy because it provides food for the citizens and raw materials for non-agric sectors of an economy for industrialization (Prayuandeepa, 2016).

Being a pre-requisite for raw materials availability, and by improving the supply of raw materials for the agro-based industries, these industries just like agriculture itself, provide employment to a vast majority of people in flour mills, rice shelling, oil mills, bakeries (bread, cake), bean cake (akara), corn mill (akamu), milk products, sugar factories, wineries, textile mills and numerous other industries that are based on agricultural products.

Creation of infrastructure for agricultural development requires roads, market places, storage facilities (warehouses of all kinds), transportation, and so on..Agricultural products when sold in the community provide revenue for the farmers that serve as purchasing power for meeting other needs of the farmers. When these farm products are exported to other countries it also earns foreign exchange for the country

.**Mining** is the extraction of valuable minerals or other geological materials from the earth, usually from an ore body, lode, vein, seam, and reef or placer deposits. These deposits form a mineralized package that is of economic interest to the miner. Ores discovered by mining include metals, coal, gemstones, limestone, chalk, precious stones, rock salt, potash, gravel, clay, and in a broader sate includes oil. There are many states in Nigeria with these ores (Howard, 1992).

For example, in Igun-Ijesha in Ogun state, over 2,000 pits have been dug by miners in their search for gold. They sell the gold they extract at prices well below global levels just because they need money for survival (All Africa, 2016). The same thing is happenings in the Jos plateau, where the precious stones dug up are sold at ridiculously low prices, again, just for the locals to have money to improve their standard of living.

Minerals provide the resources for the making of our cars, roads, bridges, computers, solar panels, our jewelries, medical technology and so on. In fact, mining creates and provides jobs for miners and helps citizens have safe and fulfilled lives (NMA, 2015). In all of these, if the products are not marketed by professional marketers, where will the economy be?

Manufacturing is the production of merchandise for use or sale using labour and machines, tools, chemicals and biological processing or formation. This term is most commonly applied to industrial production, in which raw materials are transformed into finished goods on a large scale. Such finished goods may be sold to other manufacturers for the production of other products such as aircraft, household appliances, furniture, sports equipment, automobiles; or sold to wholesalers, who in turn sell them to retailers, who then sell them to end users or consumers (Haraguchi et al, 2017).

Manufacturing's economic value can be seen in the various jobs it creates in its various activities. No machinery, no industrialization. Services are based on manufactured goods, and global trade is also based on goods (Rym et al, 2015). In all of these, if the products manufactured, are not marketed to bring in revenue for a comfortable life, how can the economy grow?

Marketing and Trade for Economic Growth and Development

The current consensus is that trade, development, and poverty are intimately linked (UNCTAD, 2013). Transaction in goods and services according to Kamay (2010) is trade and it can be divided into two: trade in goods and trade in services.

Economic growth is essential in order to reduce poverty in developing countries and to improve people's living standards. Successful domestic trade can also lead to overseas trade, when the local products are exported to other countries. Successful trade provides: (1) a crucial source of foreign exchange to help a nation's balance of payments. (2) A way of financing imports of essential capital equipment/technology components. (3) An injection of demand into the circular flow of income and spending. (4) Increased improvement in export industries and multiplier effects in other businesses and sectors helping to service export suppliers (Riley, 2017).

UAC Nigeria Plc is a living example in trading and economic development. It started trading in 1879, and today is a leading diversified company, operating in the food and beverage industry, real estate, paint and logistics. UACs brand portfolio includes leading brand such as Gala sausage roll, Mr Biggs, Funtime Coconut Chips, Supreme Ice cream, Swam Natural Spring Water, Gossy Warm Spring Water, Dulux, Grand Soya Oil, Grand Groundnut Oil, Vital Feeds and Livestock Feeds. We are all aware of UACs marketing activities. Can trade take successfully place without marketing? No.

Marketing and Tourism for Economic Development

Tourism is a service and some people see it as a collection of activities, services and industries which deliver a travel experience comprising transportation, accommodation, eating and drinking establishments, retail shops, entertainment businesses and other hospitality services provided for individuals or groups traveling away from home. *The United Nations World Tourism Organization (UNWTO 2010) sees tourism* as comprising the activities of persons traveling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes.

Faber & Gaubert (2015) opine that, tourism contributes greatly to economic development and growth in terms of employment generation (tour guides, hotel staff, cooking services, restaurants, retail and local food production, etc).Tourism also generates foreign exchange from foreign tourists. It also brings about infrastructural development that impact on life support services like roads, water, electricity, telecom and cyber com. Of course government gets extra tax revenue from tourists. Nigeria is endowed with various tourist attractions which if properly marketed, can bring about the above advantages and more. To appropriately market the tourism service, one has to consider the following factors which make up the tourism marketing mix- the product, the price, promotion, place, people, physical facilities/physical environment, process, packaging, partnership, and programming (Edgelli, 2002).

A successful tourism business requires a brand that speaks to its target markets, a content that successfully generates potential clients and a level of service that listens to customers' demands. Marketing can make this happen through in bound/out bound marketing, such as (paid on-line advertisements and direct mailings). This is based on the concept of making ones tourism business easy to find and draw potential and current tourists to ones website (Solimar, 2014). This cannot be done without marketing effort which of course helps improve the standard of living of citizens

Marketing and Business for National Growth and Development

Business development and economic development are related methods of creating economic growth. The mission of business development which most times originate from the private sector is to generate profits. In order to generate profits, the private sector creates businesses in geographical locations where the businesses can generate the most profits and then focus on markets to identify and exploit business and market opportunities (Hofstrand, 2016).

The heart of every business lies in its marketing. In other words, marketing is the life blood of business and it can help business flourish in the following ways:

Getting word out: According to Lorette (2016) for businesses to succeed, the service or product it provides must be known to potential buyers. Unless one's business is known in the community and other areas of society and the business way of communicating with customers is readily available; it will be difficult to succeed in business and so one needs adequate marketing strategies to achieve this.

Marketing helps in building a business reputation: Mikoluk (2014) opines that, in many business markets, the company's reputation has a strong influence on buying decisions. The success of a company often rests on a solid reputation which can be built through active participation in community programmes, effective communication (especially externally), and quality products and services which are created and supported by marketing effort.

In Nigeria, in 2016, Lever Brothers, Honeywell Group and PZ Cussons were adjudged the top three most reputable firms by GAIN's latest survey report. This was based on perceptions of community "give back" and engagement, quality of products and services, brand appeal and reputation. We are all aware of these companies marketing efforts and strategies and in also providing jobs for the citizens of a country.

Marketing helps to boost the sales of a business: Gross (2016) opines that, the following marketing activities could help increase the sales revenue of a business. (1) Developing new product lines (2) finding new customers (3) finding new markets (in other countries). (4) Improvement in customer service and customer relationships. (5) Retail displays and promotions and sometimes giving price discounts.

Marketing and the Growth of the Internet, E-commerce, Digital Marketing and Social Media Tools For Economic Growth and Development.

Economic and social changes are necessary for bringing about the development of a nation, and social changes can be brought about in a planned manner through social marketing (Malecki, 2009).Social marketing seeks to develop and integrate marketing concepts with other approaches to influence behaviours that benefit individuals and communities for the greater social good. Social marketing practice is guided by ethical principles. It seeks to integrate research, best practice, theory, audience and partnership insight, to inform the delivery of competition sensitive and segmented social change programmes, that are effective, efficient and sustainable (Winthrop, 2016).With the rapidly growing marketing business; technology is playing a more important role in the collection, analyzing and utilization of the large amount of information gathered from customers to predict the consequent business strategy. It is required to evaluate the customer performance, and discover the trends or patterns in customer behavior.

For this purpose, in the modern world, using the technology at a maximum level by e-commerce, internet marketing and other social media tools is very important. These new technologies have created jobs for those involved in digital marketing, e-commerce, and internet marketing in Nigeria.

The explosion, of jobs in Nigeria because of these new ways of doing faster business, and information gathering is obvious. The number of consumers online is rapidly growing in Nigeria, since the internet makes their lifestyle easier, as they tend to shop around more, because they have access to several websites. The use of the internet to make enquires before committing to purchase is important to on line shoppers. Nigeria has over 100 million active mobile phone lines (NCC, 2013).To improve marketing effort there is Face-book, Twitter, Skype, E-mail, Branding, Direct Mail, Telemarketing, Mail Order, E-Commerce (mostly in on line shopping), DVD technology- Easy Digital Downloads (EDD), Send Owl, Woo Commerce, E-Junkie, Shopify and the Digital Downloads App, DPD, Fetch App , Pulley and Gum road (Warimont,2017). In all of these, computers are needed.

Marketing and Employment Opportunities for Economic Growth and Development

One can say an economy is developed only when its citizens are gainfully employed and marketing provides numerous employment opportunities. Chand (2016) opines that, marketing comprises advertising, sales, distribution and logistics, branding, real estate, market research and so on. The development of marketing automatically gives rise to a need for people to work in several areas of marketing. Thus, employment opportunities are born.

The successful operation of marketing activities requires the services of different enterprises and organizations such as wholesalers, retailers and transportation companies (the young shall grow, Ekenedili- Chukwu, Big Joe motors, and so on), finance, insurance and advertising. Many Nigerians have benefited from these activities for employment purposes and economic development.

Marketing and Entrepreneurship Development for Economic Growth and Development

Entrepreneurship is the process of designing, launching and running a new business, which is more often than not, initially a small business; offering a product, process or service for sales or hire. The people who create these businesses are called entrepreneurs (Yetisen et al, 2015).

Tanzgrad (2016), Sappm (2017), and Coelette and Scheid (2011) all agree that entrepreneurs contribute to the economic development of a country in several ways: (1) entrepreneurs create businesses that hire people to work for them. (2) Entrepreneurs create demand for products which in turn create jobs and other businesses (like buying fabric to make clothes, or gold from other businesses to make jewelry, etc). (3) Entrepreneurs introduce new technologies to the market which promote efficiency. (4) Creation of a standard of living where consumption of high quality goods at low prices improves the standard of living of a people. (5) Community development. (6) Export of products to other countries to earn foreign exchange.

A lot of entrepreneurs abound in Nigeria according to Oladejo (2016) and some of the big ones are: Dantata – MRS Group (Trading, manufacturing oil and gas); Adedoyin – Doyin group (manufacturing and pharmaceuticals) and Okoli Stella – manufacturers of pharmaceuticals and medical consumables. Marketing does a lot to help entrepreneurs to be successful. According to Tamika (2015) marketing helps with locating and keeping customers for the entrepreneurs, increasing sales of products, help to create trust and establish reputation with customers via customer relationship and other marketing techniques.

Marketing and Electoral Politics for National Development

Political marketing is the process by which political candidates promote themselves and their platforms to voters through masterly-crafted communications aimed at gaining public support (Rbs, 2015). Stromback & Kiousis (2013) consider political marketing as a field that builds on a merger between marketing and politics. It is the application of marketing techniques, strategies and concepts to politics in a broad sense (Lees- Marshment, 2012).

Political marketing is a fundamental part of political life. Presidents and prime ministers, politicians and parties, government departments and councils all use marketing in their pursuit of political goals. Marketing helps in the following ways: (1) Market research is used, when deciding on policies and service design to understand what the people they serve and seek votes from want and need.(2) voter profiling helps create new segments to target.(3) strategy guides creation of the political brand to develop an attractive vision.(4) internal marketing guides the provision of volunteer involvement.(5) analytical and experimental research test and refine communication messages.(6) Delivery management sets expectations and helps to convey progress once a politician is elected or a programme has begun (UA,2010).

Political processes are based on exchange theory in which marketing thrives on, whereby votes are exchanged for good governance. In political campaigns, location is everything. Where the voters are and where the politicians are, as well as where information about the contestants can be got are very important. An important channel is of course the politician's own communication platform especially websites. In Nigeria, it was reported by Ekwujuru (2010) in the Vanguard Newspaper, that the PDP explored marketing communication strategies which brought them victory.

Marketing Education and Human Resources Development

Human resources development refers to the vast field of training and development provided by schools and organizations to increase the knowledge, skills, education, and abilities of their students and employees (Stewart & Sambrook, 2012). Marketing concepts and techniques may have profound impact on meeting the nation's manpower needs.

Developing nations need a wide variety of human skills to bring about economic and social development. Much of educational thrust in developing nations is restricted geographically to urban areas. Very little emphasis is placed on non-formal training programmes to increase the productivity of rural workers, farmers and the like. There is considerable truth in the saying that "the uneducated are not always unwise, and the illiterate are not always ignorant." Generally, educational institutions have defined their markets very narrowly. It is only recently that some of these educational institutions have mounted a wide variety of extension programmes or outreach activities in their surrounding communities and train people through non-academic instructions (Healthfield, 2016).

Zahur (2000) opines that, most students often do not see any relationship between their educational aspirations and job aspirations and job productivity can be increased by developing realistic training requirements for different educational categories. Before taking on a major future oriented re-organisation of the educational system, the developing nation has the immediate problem of employing the currently unemployed and improving the productivity of the currently employed. The techniques of marketing research and product development can contribute in many ways to the needed educational revolution.

Conclusion

The paper set out to show the importance of Marketing to the economic development of Nigeria. This is seen in the areas of the development of basic industries like agriculture, mining, and manufacturing. Marketing's importance in the areas of trade, business growth, provision of employment opportunities, helping with entrepreneurial development, marketing communication development, tourism, and electoral politics was also shown. It can be said, without doubt, that marketing has always enhanced economic growth by provoking and channeling consumption over the years and it will still continue performing this function on earth for millennia to come.

Therefore, no nation, corporation, organization or individual can ignore the ***importance*** that marketing has the in the development of society or group of people and the economy.

Recommendations

From the above conclusion, the following recommendations are made:

(1) Marketing as a discipline should be made compulsory in all tertiary educational institutions in Nigeria by incorporating in the schools' curriculum. It has already been done in secondary schools in Edo state.

.(2) Marketing as a practice should have its activities enhanced (especially with small scale business men and women), since a nation's development is tied to its level of business growth and marketing is the life blood of business.

References

AMA, (2013). Definition of Marketing.
Retrieved from: https://www.ama.org/boutAMApages/Definitionofmarketing.aspx August, 10

Amadeo, K. (2017). What is Economic Growth?
Retrieved from: https://www.thebalance.com/what-is-economicgrowth September, 1

Chand, S. (2016). 7 Major Importance of Marketing Management.
Retrieved from www.yourarticlelibrary.com/maketing/7-impotanceofmarketingmanagement. July,20

Coxhead, I. (2017).Economic Development and the Enviroment.
Retrieved from: The New Palgrave Dictionary of Economics Online DOI: 1057/9780230226203.029 Sept 3

Druncker, P. (1988), in Zahur, A.B.N. (2000). Relating the Importance of Marketing to National Development. Retrieved from www.bangla.2000.com/Businessworld/Features/Dec 2000/eng-feature-default-detail/03.shtm

Ekwujuru, P. (2010). PDP Explores Marketing Communication Strategy. Retrieved from: www.Vanguardngr.com>Finance July,10

Gross, J. (2016). Why marketing is so important.
Retrieved from: movingtargets.com/blog/business/whymarketingissoimportant.

Healthfield, S. M. (2016). What is Human Resource Development?
Retrieved from: https://www.thebalance.com/whatishuman-resourcedevelopment

Jaber, B. & Gauber, C. (2015). Tourism and Economic Development: Evidence from Mexico's Coastline. Retrieved from: http://www.nber.org/papers/w22300 (DOI): 10.3386/w22300

Kiranvoleti, M. (2016). .Role of Marketing in Economic growth.
Retrieved from: http://milesmedia.com/role of

Lees-Marshment, J. (2012). Routledge Handbook of Political Marketing.
Abingdon, Oxon: Routledge. P. 388

Lorette, K. (2016). The Importance of Marketing for the Success of a Biz.
Retrieved from: smallbusiness.chroncom/importanceofmarketingforthesucessofabiz.

Mack, S. (2015).smallbusiness.chron.com/importance-retail-marketing-65695.html

Malecki, E. (2009). Technology & Economic Development: The Dynamics of Local, Regional and National Change. Retrieved from: https://papers.ssrn.com/SO13/papers.

Nico Luk, K. (2014). The Importance of Marketing: 10 Reasons.
Retrieved from: https://blogudemy.com/importanceofmarketing.

NMA, (2015). Minerals Mining Generates Economic Growth.
Retrieved from: minerals-mininggenerates-economicgrowth

Onah, J. (2007). Marketing and Management Practice in Nigeria. Journal of national institute of Nigeria (NIMN),Vol 1,No.1, 2012.

Raymay, S.A. (2010). Linkages Between Trade, Development And Poverty Reduction – Experience from Pakistan. Retrieved from: www.cuts-gtee.org/tdp/pdf/campaign-ketspakistan.pdf.

Riley, (2017). Importance of Trade for Developing Countries.
Retrieved from: https://wwwtutor2v.net/economics/referrence/importanceof tradefordevelopingcountries.

Rym, B., Guunet, A. & Gabou, S. (2015). Nature of the Service Act and its Recipients
Retrieved from: https://www.researchgate.net/.../Nature-of-the-Service-Act-and-its-*Recipients_Business* Models, *Service* and *Service* Science

Solimar, I. (2016). The Economic Impact of Tourism Development.
Retrieved from: www.solimerinternational.com/resourcespage/item/146/economicimpactoftourismdevelopment. July, 29

Stewart, J. and Sambrook, S. (2012). The Historical Development of Human Resources Development in the United Kingdom. Retrieved from: journals.sagepub.com/doi/abs/10.1177115334843.

Stromback, J., Mitrook, M.A., & Kiousis, S. (2010). Bridging To Schools Of Thought: Applications of Public Relationships Thing to Political Marketing. Journal of political marketing, 9.1, 73-92. Retrieved from: https://jesperstromback.files.com/2009/121/jpm20103.pdf.June,10

Tamika, (2015). Why Is Marketing So Important For Entrepreneurs. Retrieved from simplydevise.net/marketing-important-entrepreneurs.

Warrmonte, J. (2017). Selling Products Online: The Best Ways to Sell Digital Goods – Tools and Tricks. Retrieved from https://e-commerce-platforms.com/e-commercesellingadvice/top-1-best-ways-sell-digitalgoodsonline August,28

Winthrop, M. (2016). The Process of Developing the Consensus Definition of Social Marketing. Retrieved from: www.i.socialmarketing/org/socialmaketingdefinition.

Yetisen, A.K., Volpatt, C.R., Coskun, A. Yun, S.H. (2015). Entrepreneurship. Retrieved from: https://www.researchgate.net/publication292193256-entrepreneurship. July, 12.

Zahur, (2000). Relating the Importance of Marketing to Economic Development. Retrieved from: www.bangla,2000,.com/businesWorld/Features/Dec.2000/.eng July,28.

COMPLIANCE TO MAINTENANCE SCHEDULE: A REVIEW OF MINI POWERHOUSES OF AUCHI POLYTECHNIC, EDO STATE

BY

AKHIGBE, A.E, IHUOMA, S.C & EJIOFOR, V.E
DEPARTMENT OF MACHANICAL ENGINEERING TECHNOLOGY, AUCHI POLYTECHNIC

BEING A PAPER PRESENTED

TO THE JOURNAL OF ARTS, MANAGEMENT, SCIENCE AND TECHNOLOGY AUCHI POLYTECHNIC, AUCHI, EDO STATE

Abstract
There is no gainsaying that public power supply is grossly inadequate in Nigeria today. Most establishments have continued to rely on generators and mini powerhouses for power supply. In order to keep them running, good and functional maintenance practices must be in place. This paper examined the level of compliance to maintenance schedule in the mini Power Houses of Auchi Polytechnic, Edo State and subsequently benchmarked and evaluated the practices with the world best maintenance practices. The relationship between maintenance practices and plant performance in terms of availability, operation and maintenance costs was also determined. The case study was done with a target population of all the three operational areas namely, campuses 1 & 11 and Rector's quarters. The study used primary data which was gathered by means of a self-administered questionnaire issued to respondents and secondary data which was extracted from internal operational reports in works and maintenance department of the school. The average response of each item on the questionnaire was calculated and the quantity identified to evaluate the maintenance practices at works and maintenance department while benchmarking them with the world best practices. The study established that Auchi Polytechnic has in place good maintenance practices. The study established that, although Auchi Polytechnic has good maintenance practices in place but when benchmarked with world best practices, it was apparent that breakdown maintenances works were significantly high. However, it was observed that the high breakdown maintenances works recorded was as a result of poor maintenance works. It is the view of this paper that, there is need to have adequate and the proper facilities that would enhance the various maintenance works for effective and efficient generation and distribution of power to meet the desired expectations of the school. This therefore calls for improvement of maintenance practices to meet world best practices by building internal capacities and having proactive internal technical trainings and audits.
Keywords- Maintenance, Powerhouse, Benchmarking and Compliance

Introduction

A production system requires different types of equipment to achieve the desired goals; all equipment must have a high availability and reliability in order to ensure a stable process. The maintenance department is responsible for keeping the equipment in good working condition and also to ensure that it can deliver according to the specifications (Al- Turki, 2011). According to Bellgram and Saften (2010), it is widely known that the maintenance currently is viewed by management as a big expense and it is not an unusual opinion since maintenance does not include any value adding activities. In recent times it is increasingly common for establishments to work with maintenance as a center point of profit (Alsyouf, 2007). Maintenance policies and practices are aimed at minimizing the downtime of equipment and facilities to ensure that proactive maintenance is properly being used to sustain the availability of all the facilities (Rils and Thorsteinsson, 1997). This study reviews the existing maintenance practices in the power generating facilities referred to as mini powerhouses of Auchi polytechnic.

Campbell and Reyos-Picknell (2006), in a number of surveys conducted in industries throughout the United States have found that 70% of equipment failures are self-induced and that maintenance personnel who are not following what is termed as "Maintenance Schedule" substantially contribute to these failures. Olufunke (2011), in his study posited that between 30% and 50% of the self-induced failures are as a result of maintenance personnel not knowing the basics of maintenance. He also found that maintenance personnel, who, although skilled, choose not to follow best maintenance repair practices, potentially causing another 20% to 30% of those failures. This case study focuses on best maintenance practices necessary for maintenance personnel to keep equipment operating at peak reliability with a view to reducing breakdown costs and increasing productivity and capacity. The potential cost savings can often be beyond the understanding or comprehension of management. Therefore, the maintenance function must ensure that generating sets are in optimum operating condition. The normal practice of quick response to failures should be replaced with maintenance practices that will sustain optimum operating condition of all plant systems (Ighodora, 2009). The plant should not only be operating but reliably without creating abnormal levels of product quality problems, preventive maintenance downtime or delays.

Approaches To Maintenance

Several maintenance approaches, strategies and concepts have been implemented by practitioners or suggested by intellectuals. Maintenance approaches and their development have been discussed by many authors. Usually, maintenance actions are aimed at minimizing failure and the consequences of failure of industrial plant, machinery and equipment as far as possible (Bavilacqua and Braglia, 1991). These actions can take several forms such as breakdown maintenance, preventive maintenance (PM), i.e. replacing components at a pre-determined time using statistical models based on collected historical failure data, or condition-based maintenance (CBM) by monitoring the condition of the component using one (or more) condition monitoring (CM) techniques (Atiba and Fauad, 2005). However, in all cases, the decision maker needs to select from all the applicable maintenance approaches and the right policy for each component, module or equipment (Campbell and Reyos-Picknell , 2006). A study by Fernando and Gilbert (2009) revealed that the availability of a system is strongly associated with its parts reliability and the maintenance policy adopted. The identification and implementation of the appropriate maintenance policy will enable the managers to avoid premature replacement costs, maintain stable production capabilities, and prevent the deterioration of the system and its components (Bavilacqua and Braglia, 1991). According to ISO/SS 13306 standards, maintenance approaches has been divided into two groups, such as Corrective maintenance and Preventive maintenance as shown in Fig 1, and in practice there are many combinations of these two approaches. The corrective approach is further subdivided into immediate and deferred. The preventive maintenance has two subgroups such as Condition based maintenance and predetermined maintenance. This states that the preventive maintenance approach can be condition or time concerned. The preventive maintenance is proactive while the corrective maintenance is reactive form of maintenance and, for all the approaches time plays an important role (ISO, 2002).

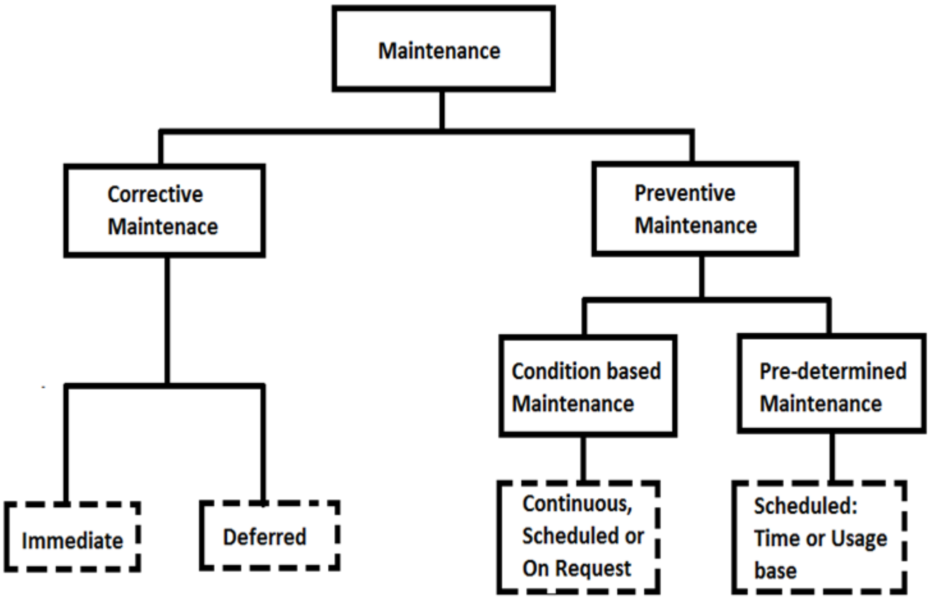


Fig 1: Maintenance overview according to ISO/SS 13306 standard

A Description OF A Mini Powerhouse

Generally, a Mini Powerhouse provides limited power in the event of a power outage. They consist of an engine, a generator, control panels, and possibly a fuel storage tank. The engine drives the generator to create electrical power. NFPA defines two classes of electric generators: Level-1 generators provide support for life safety systems, such as emergency lighting, fire protection and ventilation to provide for safe egress in the event of an emergency; Level-2 generators encompass all other uses such as backup power for data centers, auxiliary systems, process controls, refrigeration, and HVAC systems. For the purposes of this recommended practice, Level-1 generators are referred to as emergency generators and Level-2 generators as standby generators. Emergency generators are typically 200 kW or smaller and run on gasoline, natural gas or diesel fuel. Standby generators are typically much larger diesel engine units, often between 200 kW and 2,000kW (Sani etal, 2011).

In Auchi polytechnic, the standby generators are in use and are usually stationary units permanently wired into the building's electrical distribution system through a transfer switch. As at the time of this study, Auchi polytechnic was being served by over 8 standby generators located on the two campuses and the Rectors' quarters.

Maintenance Practices In Auchi Polytechnic

Best maintenance practices are defined in two categories: Standards and Methods. Standards are the measurable performance levels of maintenance execution; methods and strategies must be practiced in order to meet the standards. The combination of standards with methods and strategies provides the elements of an integrated planned maintenance system. Achievement of the best maintenance practice standards (maintenance excellence) is accomplished through an interactive and integrated series of links with an array of methods and strategies (Chandrahas etal, 2015). Auchi Polytechnic has its maintenance management system (Plant Maintenance, PM) integrated with the institution's Estate and Works department. All maintenance works are captured on work orders. This includes planned/scheduled, corrective, emergency, etc. The work order is the primary tool for managing labor resources and measuring department effectiveness. The PM output provides maintenance, engineering, operations, supply chain and upper management with accurate and effective reports needed for evaluation and management.

The types of reports and data tracking obtained from a PM includes: open work orders, closed work orders, mean time between failures (MTBF),cost per reports, scheduled compliance, plant maintenance overdue, labor allocation, spare parts demand and usage reports.

Methodology

This is a case study of cross sectional nature which adopted a description research design. This research was designed to focus on identifying the existing maintenance practices at mini power houses of Auchi Polytechnic, Auchi, comparing them with world best practices and determining the influence it has on the generators' availabilities and performances. Three research questions comprising of various related items were formulated. They are;

1. The general understanding of the types of maintenance strategies, maintenance provisions and works employed to ensure that the mini Powerhouses of Auchi Polytechnic are functional and available.
2. Types of maintenance approach and the respective mix adopted in Auchi Polytechnic mini powerhouses.
3. Benchmarking mini powerhouses in Auchi Polytechnic maintenance practices with world best.

The population of study was drawn from Campus 1, Campus11 and Rectors quarters' mini power stations of Auchi Polytechnic under review since they produce almost the entire Polytechnic's power supply in the absence of public power supply. Stratified random sampling method was used to select sample unit. According to Kothari (2004), a sample of 25 percent of the population is adequate when the sampling frame is well stratified.

Both primary and secondary data were used in this study. The primary data was gathered through objective observations and survey. The main instrument for data collection was a structured set of questionnaires that have been authenticated and certified by professionals before they were administered. The questions were constructed so as to address specific objectives and provide a variety of possible responses. The respondents included Foremen, Engineers, Technical officers and Technicians. The study targeted a sample population of 39 maintenance staff in all the three operational areas of a population of 150 staff. The questionnaires were administered to 39 maintenance staff of work department of Auchi Polytechnic working at the mini powerhouses in Campus 1, Campus 11 and Rectors quarters, 37 of them responded and this translates to 94.87% response rate. The entire return rate is statistically representative, therefore, enhancing generalization of the research results. The statistical results were triangulated with extensive literature to draw lessons learnt from other similar research works. More so, 45.95% of the respondents had attained National diploma or Higher national diploma level of education, 43.24% had degree level of education and 10.81% had masters' degree. This indicates that the level of educational attainment of the plant maintenance staff is adequate for them to have acquired the necessary technical skills.

The study used quantitative method of data analysis. To ensure ease of analysis and minimize the margin error, the questions were coded according to each of the separate variables. Available data analysis tools and software packages were used to analyze the primary data. The statistical technique of regression analysis was specifically used to analyze the secondary data to determine the relationship between the generators' availability against the generator breakdowns and operation and maintenance costs. The raw quantitative data was keyed into the computer and analyzed using Statistical Package for Social Sciences (SPSS) program. The findings of the study were presented by use of tables and charts as applicable to convey the visual impressions of the meaning or to clarify information that may otherwise be hidden within the data. Study conclusions were based on the summary of the data analysis. The model used in the study is given as:

$Y = a + \beta_1 X_1 + \beta_2 X_2,$

β_1, β_2 = Correlation coefficients

Y= Generators' Performance in terms of availability

X_1 = Operation and Maintenance costs

X_2 = No of Breakdowns

Results And Discussion

The responses from the various respondents have been summarized and presented in terms of percentages with respect to the items on each research question.

Table 1 addresses research *question 1* on the general understanding of the types of maintenance strategies, maintenance provisions and works employed to ensure that the mini Powerhouses of Auchi Polytechnic are functional and available.

Table 1: Responses on the general understanding of the types of maintenance strategies, maintenance provisions and works employed to ensure that the mini Powerhouses of Auchi Polytechnic are functional and available

	Description of item	Frequency	
		Yes	%
1	Are you familiar with corrective maintenance?	37	100
2	Are you familiar with preventive maintenance?	37	100
3	Are you familiar with condition based maintenance?	37	100
4	Are you familiar with plant maintenance module in System application products (SAP)?	5	13.5
5	Does your plant have maintenance procedure for all its equipments?	35	94.89
6	Do you use plant maintenance in management of your maintenance works?	34	91.89
7	Is this maintenance procedures (checklist) followed during maintenances?	34	91.89
8	Are the measured parameters during maintenance works benchmarked to any known standard?	33	89.19
9	Does your station have an annual training plan for every maintenance staff?	21	56.76
10	Do you have a service level agreement for provision of spares with manufacturers?	5	13.51

As shown in table 1, all the respondents (100%) were familiar with the three types of maintenances (BD, CBM and PM) and only 13.5% of them are conversant with the use the plant maintenance software module in system applications products (SAP) in their maintenance management works. More so, over 90% of the respondents use maintenance procedure & checklist in their maintenance activities and 89.19%, agreed that the measured parameters are in line with standards. The respondents were divided in the ratio of 21:16 on existence and non existence of an annual training program for the maintenance staff. However, majority (86.49%) of them indicated that there were no service level agreements (SLA) between Auchi Polytechnic and spare manufacturers or suppliers or Original Equipment Manufacturers (OEM).

It is observed that with the revelation above, Auchi Polytechnic can upgrade its maintenance approach by introducing a plant maintenance software module in their SAP system to make operations more efficient. The scores recorded on the respondent's awareness of maintenance practices and aspects of maintenances is a confirmation of establishment of a good maintenance system. However, the low score on service level agreement (SLA) with manufacturers was expected, since it is not common practice to find government organization having SLA in place and requires a major transformation initiative which may require time to be implemented. The respondents' position on training program is satisfactory which is an indication of the existence of training programmes, and it is the view of this paper that there is need to increase the number of trainings on maintenance.

Table 2 presents a summary in tabular form of the findings with regards to research *question 2* on the types of maintenance approaches adopted in Auchi Polytechnic mini Powerhouses.

Table 2: Responses on the types of maintenance approach and the respective mix adopted in Auchi Polytechnic mini powerhouses.

Type of maintenance	**Campus 1**		**Campus11**		**Rector's quarters**	
	Frequency	**%**	**Frequency**	**%**	**Frequency**	**%**
Corrective	1	5.88	1	11.11	1	9.09
Preventive	9	52.94	1	11.11	4	36.36
CBM based	0	0.00	1	11.11	2	18.18
All	7	41.18	6	66.67	4	36.36
Total	17	100	9	100	11	100

As shown in table 2, a mix of the 3 types of maintenance approaches, namely corrective, preventive and condition based maintenances (CBM) scored relatively high marks from the respondents of all the areas with campus11 recording the highest score of (66.67%), followed by Campus1 (41.18%) and rectors quarters (36.36%). Preventive maintenance was dominant on campus 1 recording a high score of 52.94% from the respondents.

A full establishment of CBM is a cost intensive exercise and the system is yet to be properlyestablished in Auchi Polytechnic, this would explain the low score recorded on CBM. Corrective maintenance on the other hand is not popular and the staff members were reluctant to disclose their weaknesses, hence the low score under this aspect and high score in favour of the other maintenance approaches. Therefore, it is believed by the researchers that the three types of approaches to maintenance are the most applicable in all the power generating houses with the Mini powerhouses in campus 1 adopting mostly the preventive maintenance option.

Table 3 addresses research *question 3* used for the benchmarking and evaluation of Auchi Polytechnic's maintenance practices as it compares with world best practices. In the analyses, values assigned to the items as world best standards were compared to the values obtained from the responses of the respondents.

Table 3: Benchmarking and evaluation of Auchi Polytechnic's maintenance practices as it compares with world best practices

	Description	**Auchi Poly Mini powerhouse mean**	**Standard Deviation**	**Benchmark**	**% Variation**
1	Plants availability BM(95)	90.25	0.73	95	4.98
2	Percentage of daily work allocated to staff is preventive maintenance BM(> 95)	55.34	3.2	65	14.86
3	Variance between maintenance work and budgeted amount BM(5%)	5.93	0.53	5	(18.60)
4	Percentage of maintenance work carried by a work order BM(90)	73.43	3.87	100	26.57
5	Percentage of programmed work is done as scheduled BM(100)	60.49	3.05	90	32.79
6	Percentage of work orders that are closed in a month BM(100)	64.44	3.92	100	35.56
7	Percentage of work orders generated is planned before the outage BM(90)	57.49	3.85	90	36.12
8	Technical training days to staff per year BM (15%)	7.14	0.65	15	52.40
9	Percentage of total overtime against total maintenance time BM (5%)	9.86	0.84	5	(97.20)
10	Percentage of PM and CBM costs to the total maintenance cost BM (15-30%)	45.01	3.3	22.5	(100.04)
11	Callouts per month BM(< 2)	4.27	0.46	2	(113.50)
12	Percentage of work orders generated by breakdown maintenance BM(10)	44.28	4.46	10	(342.80)

As shown in table 3, there were four parameters where the Mini Powerhouses of Auchi Polytechnic's maintenance practices variance against the world best practices were in the range of 26.52% to 36.12% close. These variables were percentage of maintenance work carried by a work order, percentage of programmed work done as scheduled, and percentage of opened work orders that are closed in a month and percentage of work orders generated and planned before the outage.

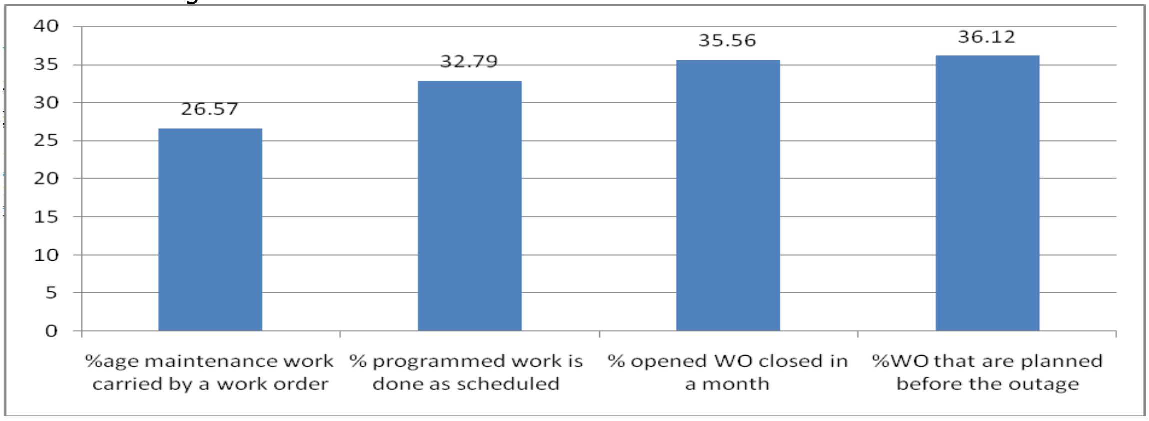


Figure 2: Variance against Benchmarked Items Related to Work order (WO)

All the four aspects of maintenance practices could be easily seen in the graph as shown in fig 2. There was an area of concern where the variances were extremely high as shown in fig 3. This indicated that there is poor response to breakdowns and funding of breakdown maintenance activities.

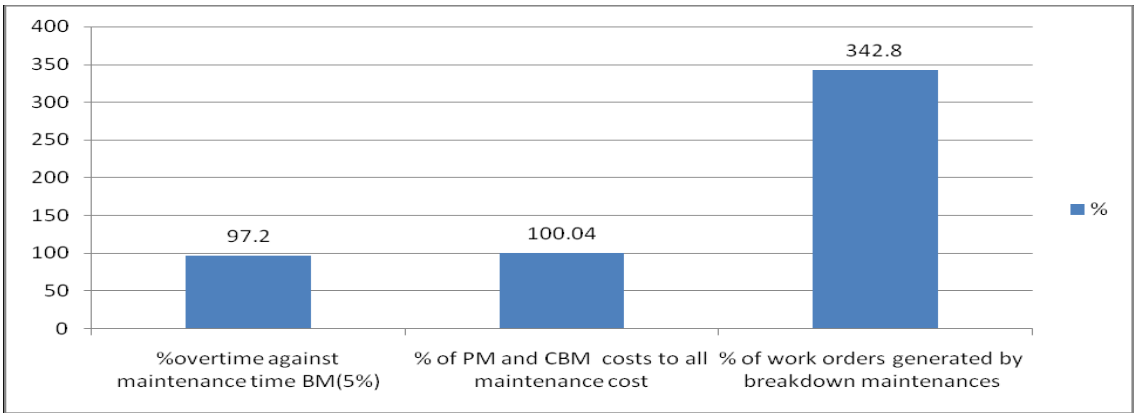


Figure 3: Variance against Benchmarked Items Related to Machine Breakdown

Figure 3 above compares maintenance aspects that are directly related to machine breakdowns and this gives an indication of the quality of the maintenance works done. With the highest score of 342.8% recorded on percentage of work orders generated by breakdown maintenances, the overtime and maintenance cost would also be expected to be high. This really compromises the reliability and quality of power generated and supplied (World Energy Council, 2004). Comparatively, the plant's availability recorded the best performance of a small variance of 4.98%. This could be due to the relatively low variance recorded by the daily work allocated to staff for preventive maintenance activities when benchmarked with world best practices, indicating an above average compliance in this regards.

The only major gap as observed from majority of the respondents was lack of service level agreements which they indicated was lacking. From the analysis of the internal reports there is an indication of good overall generating sets performances buthowever, the major concern was the high percentage of work orders generated for breakdown maintenance works which recorded an extremely high variance of 342%. This compromises the reliability and quality of the power generated and requires to be addressed.There was a weak relation between O&M cost, number of breakdowns and the plant availabilities. This could be attributed to poor records of the expenses incurred during all the types of maintenances, which should be well captured and differentiated.

Conclusion

The study found that the maintenance practices are well established in works and maintenance department of Auchi Polytechnic and the mini powerhouses, even without maintenance software in place to enhance it. The main approach to maintenance was found to be mainly a mix of corrective, preventive and condition based maintenances in the three operational areas used for this research but with preventive maintenance being the dominant practice in campus 1. There were no spares contract between the Institution and the manufacturers and the level of breakdown maintenances were found to be extremely high compared with world's best practices. The generating sets availability was the best performance on the benchmarked categories. The study further showed that the numbers of breakdowns in generators have a profound effect on generators availability and operations and maintenance costs.

With these findings, the works and maintenance department has fairly implemented the methods and strategies aspect of maintenance practices but the standards of the maintenance execution are yet to be achieved. This agrees with the survey conducted in the industries in United States where it indicated that between 30% and 50% poor maintenance failure are due to maintenance personnel not executing maintenance activities using world best standards as checklist and this usually impart negatively on costs. There is therefore need for Auchi Polytechnic to develop and implement both preventive and corrective maintenance tasks that would ensure the maximum use of maintenance resources and the production capacity in accordance with World Best Practices. As revealed, the relationship between mini powerhouses' availability and O&M costs and maintenance activities leads to the conclusion that maintenance practices has a direct relationship with the mini powerhouses' performance. It is important that all the expenses incurred on maintenance works are well captured to help the management in realizing the benefits of good maintenance practices.

Recommendations

As a result of the findings of this work, the following recommendations are made;

- Auchi Polytechnic should undertake a quantitative survey to determine the actual impact of improving maintenances practices in terms of improving the reliability of power with a view to ascertaining the profitability of the institution.
- The Polytechnic should initiate spare parts maintenance contracts with manufacturers, build internal capacities and there should also be periodic proactive internal technical audits.
- There is need to retrain staff of the Estate and Works department on modern technology of repair and maintenance and the use of certified checklists for generating sets.
- There should be strict monitoring, adherence and compliance to manufacturer's maintenance schedule of mini powerhouse/ generating sets should be followed religiously without alteration.
- Auchi Polytechnic should upgrade its maintenance approach by introducing a plant maintenance software module in their maintenance system to make operations more efficient and economical.

References

Al-Turki, U. (2011): A Framework For Strategic Planning in Maintenance. Journal of Quality in Maintenance Engineering, 17 (2), 150-152

Alsyouf, F. (2007): The Role of Maintenance in Improving Companies Productivity and Profit Abilities. International Journal of Production Economics, 105 (1), 70-78.

Atiba, A. and Fawad, D. (2005): Maintenance Strategy and Reliability Optimization. Emetrald Group Publications (Ed, 2005, p6).

Bavilacqua, M. and Braglia, M. (1991): The Analytic Hierarchy Process Applied to Maintenance Strategy Selection. Journal of Reliability Engineering and System Safety 70 (2000), 71-83

Bellgram, M. and Safsten K. (2010): Production: Development Design and Operation of Production Systems. (Electronic) New York: Springer-Verlag.

Campbell, J.D. andReyos – Pickmill, J.V.C (2006): Uptime: Strategies for Excellence in Maintenance Management (2nd Edition) (Electronic) New York Production Press

Chandrahas, Santosh, Kan and Deepale, M. (2015): Maintenance Strategy and Decision Making – ATTP method. International Journal of Advanced Engineering Research and Studies, 10(2), 102-1.04

Fernando, A. and Gibert, C. (2009): Choosing an Optimum Maintenance Strategy (2nd Ed). (Electronic), New York Press.

Ighodora, C. A. (2009): Transport Infrastructure and Economic Growth in Nigeria. Journal of research and national development, 7(2), 1-13

International Standard Organization, ISO (2002): Handbook on maintenance and standards McGraw Hill Publishers, London.

Kothari, C. (2004): Research Methodology: Methods and Techniques (2nd Edition). New Age International Limited, New Delhi, India

Olufunke, A.M (2011). Education of Maintenance Culture in Nigeria: Implications for Community Development. International Journal of Sociology and Anthropology, 3 (8), 290-294

Rils, J.O. and Thorsteinsson, U. (1997): Trends and Perspectives in Industrial Maintenance Management. Journal of Manufacturing Systems, 16 (6), 437-453

Sani, S.I., Mohammed, A.H., Shuko, F.S and Awang, M. (2011): Development of Maintenance Culture. A Conceptual Framework. International Conference of Management Proceeding, 1007-1013

World Energy council (2004): Performance of Generating Plants, IMA Conference, Ediburg: New Realities New Needs. Proceedings of IMA Conference, Edinburg, P 1-13

Estimation of Power Losses in Electric Power Distribution System. (A case study of Ibie-Feeder, Auchi, Nigeria)

By

Ajayi.A[1] , Izuagie F.I[2] and Osayi F.S[3]
Corresponding Email: adebabaoba@yahoo.com,izuagiefestus@gmail.com

[1,2,3]Department of Electrical and Electronic Engineering, Auchi Polytechnic, Auchi Edo state Nigeria

Abstract

Losses in power system emanate from overloading and ageing of system components. Power losses on Ibie feeder for a period of May 2014 to April 2015 shows that the month of May 2014 has the highest amount of losses on the Ibie feeder for the period under consideration (0.248MW), with a maximum loading of 5.2MW. The trend of these losses remained fairly on a constant level due to maximum loading for various months. Average maximum loading on the feeder is 3.7416MW with an average power loss of 0.1820158MW on Ibie feeder. Computation of an average loss on the 415V distribution network gives 0.1820158MW and a total transformer losses (Load and No-Load) on the 11kV network gives 0.07372 indicating maximum technical loss on the feeder in May 2014 with 0.365723MW. Benin Electricity distribution company of Nigeria(BEDC) Auchi business district was consulted for data used for the analysis in the course of this study. power losses on the feeder were calculated on the basis of the maximum monthly loading for the months of (may2014-April 2015).the route length of the feeder, resistivity of the aluminum conductor used and the cross sectional area of the feeder conductor were employed in calculating the resistance of the feeder conductor and the load current along the feeder conductor, which further gives the power loss on the feeder on a monthly basis.

Keywords: Losses, Distribution network, Transformer, Power, Non-Technical Losses

1. Introduction

Electricity plays a very important role in the socio-economic and technological development of every nation. The electricity demand in Nigeria is far greater than the supply; as a result, the supply is epileptic in nature. This acute electricity problem in the country hinders its development, despite the fact of the availability of vast natural resources. It is widely accepted that there is a strong correlation between socio-economic development and the availability of electricity (Sambo,2008).

The history of electricity in Nigeria dates back to 1896 when electricity was first produced in Lagos, with 2Nos.30kw,single-phase,80HZ,1KVgenerating unit installed on the site of the former electricity Headquarters along marina street in Lagos (Aderounmu,2008). Fifteen years after its introduction in England. Despite the fact that its existence in the country is over a century, its development has been at a slow rate. In 1950, a central body was established by the legislative council, which transferred electricity supply and development to the care of the central body known as the Electricity Corporation of Nigeria (ECN), now defunct. Other bodies like Native Authorities and Nigeria Electricity Supply Company (NESCO) have licenses to produce electricity in some locations in Nigeria. There was another body known as Niger Darns Authority (NDA) established by an act of parliament. The Authority was responsible for the construction and maintenance of dams and other works on the River Niger and elsewhere, generating electricity by means of water power, improving and promoting fish brines and irrigation (Obadote, 2009).The energy produced by NDA was sold to the Electricity Corporation of Nigeria for distribution and sales at utility voltages.

Basically, the electric power system comprises of three major sub-systems: generation, transmission, and distribution systems. The consumption of electrical energy by a country has been a major indicator of the level of its development. Its significant is notable by its effects on the country infrastructure, its socio-economic activities and above all the nation's standard of living. The effects of electrical energy is so enormous on the standard of living such that an average Nigerian live on less than $2 daily (Okoro and Madueme,2004). The major amount of losses in a power system is in the primary and secondary distribution lines while transmission and sub-transmission lines account for only about 4 percent of the total line losses (Pabla,2004). A service line is a line connecting the consumer's installation to a distributor. This is the last link of the path over which electrical energy is transmitted from the power station to the consumer. The electric supply authority supplies power to the consumers through low voltage, three phase, and four-wire distributors. Large consumers are, however supplied at higher voltages through three-wire, high voltage Feeders in such cases the consumer has his own step-down substation to obtain the required voltage. The service line may consist of bare conductors coming from the distributors to a bracket installed in the consumer's premises from where connections to his meter are taken through a cable.
The research study is focused on determining and analyzing the effects and causes of losses on the Auchi distribution network and a means of reducing these losses to a minimal level.

2. Materials and Methods

Benin Electricity Distribution Company of Nigeria (BEDC) Auchi business district was consulted for data used for analysis in the course of this project. This data was formally released with approval of the business manager through the senior manager distribution (SMD).

Data obtained from the business district are:

I. Map showing the layout of the Ibies feeder;
II. Monthly return on loading of 33kV feeders;
III. Energy billed in Auchi (kWh);
IV. Monthly loading of injection substations;
V. Transformer's manufacturer, transformer's serial number and the year of manufacture on the Ibie feeder;
VI. Feeder's route length, coverage area and distance between transformers;
VII. Transformer losses (i.e No-Load and Load losses); and

VIII. Daily load allocation to and load received in Auchi business unit.

2.1 Calculation of power loss on the Ibie feeder

Power losses on the Ibie feeder were calculated on the basis of the maximum monthly loading on the feeder for the months (May 2014-April 2015), with a maximum loading of 5MW, the route length of the feeder (i.e 10km), resistivity of the aluminum conductor used, and the cross-sectional area of the feeder conductor were employed in calculating the resistance of the feeder conductor and the load current along the feeder conductor, which further gives the power loss on the feeder on a monthly basis. Conductor used for the feeder is specified to have a cross-sectional area of $150mm^2$, and resistivity of $2.82 \times 10^{-8}\Omega m$, the 415V distributor varies in sizes depending on the current ($35mm^2$, $50mm^2$, $70mm^2$, $100mm^2$) (Pabla,2004). In order to estimate the distributor total length, the numbers of poles leaving the secondary winding of the transformer for its various supplies were counted and the distance from one pole to another is given to be 45m as specified by BEDC Auchi distribution district.

$$P_{ph} = \sqrt{3}I_L V_L \cos\theta \qquad \text{.......................................} [1]$$

Where:

I_L is the line current through the conductor, V_L is the line voltage, and $\cos\theta$ is power factor.

The resistances of these lengths of distributor are shown below:

$$= \text{Resistance 'R'} = \frac{P \, X \, L}{A} \qquad \text{..} [2]$$

Where R is the resistance in ohm, p is the resistivity of the conductor in ohm-meter, A is the cross-sectional area of the conductor ($100mm^2$) and L is the total distance in meters covered by the conductor. The distance between poles on the distribution network as specified by BEDC, Auchi business district is specified to be 45m uniformly.

100kVA: 45 x120 = 5.4km
200kVA: 45 x 70 = 3.15km
300kVA: 45 x 45 = 2.025km
315kVA: 45 x 35 = 1.575km
500kKA: 45 x 10 = 0.45km

The power loss on the 415V lines fed by each transformer is calculated using:

$$P_{loss} = I_L^2 R_L \qquad \text{...} [3]$$

Where P_{loss} is the power loss in the transformer under study, I_L is the line current and R_L is the line resistance. Load and No-Load losses for 200KVA, 300kVA, and that of 500kVA was interpolated using the expression in equation 4.

$$f(x) = \frac{x - x0}{x1 - x0}[f(x1) - f(x0)] + f(x0) \qquad \text{............} \qquad [4]$$

Where, x is the transformer rating in kVA whose Load and No-Load losses is to be calculated.

x_1 is the transformer rating in kVA whose Load and No-Load losses are obtainable from the table below (Pabla,2004). x_1 is the upper bound for the interpolation $f(x_0)$ and $f(x_1)$ are corresponding value of the considered rated transformer No-Load or Load Losses.

3. Results and discussion

The result of power losses on Ibie feeder for a period of May 2014 to April 2015 shows that the month of May 2014 has the highest amount of losses on the Ibie feeder for the period under consideration (0.248MW), with a maximum loading of 5.2MW (Table 1). The trend of these losses remained fairly on a constant level (i.e. varying) due to maximum loading for various months. Average maximum loading on the feeder is 3.7416MW with an average power loss of 0.1820158MW on Ibie feeder. The month of January 2015 and March 2015 recorded the lowest amount of losses (0.07218MW) and (0.01128) with a maximum loading of 2.8MW and 3.5MW respectively (Table 1). The amount of losses associated with other months from Table 1 include: June 2014 (0.21213MW), July 2014,(0.18645), September2014 (0.18645MW) and October 2014 (0.16242MW). August 2014 (0.19482MW), February 2015 (0.09428MW). Computation of an average loss on the 415V distribution network gives 0.1820158MW and a total transformer losses (Load and No-Load) on the 11kV network gives 0.07372. This implies that technical loss on the feeder network is maximal in May 2014 with 0.365723MW (Fig.1).

Technical losses are naturally occurring losses (caused by actions internal to the power system) and consist mainly of power dissipation in electrical system components such as distribution (415) lines (distributors), power transformers, etc. Technical losses are possible to compute and control, provided the power system consists of known quantities of loads.

Power losses on Ibie feeder have far been varying, and could not be presumed for subsequent month that is not covered by this research because:

i. Electricity theft account for substantial quantity of power loss, especially in public loaded environment; and
ii. Over loading of the distribution system.

The impact-of power loss on distribution system has great effect on utility companies (BEDC) and its consumer which is enormous as it results in high economic burden on the nation, since available energy cannot still meet demand. The total technical loss on Ibie feeder amounted to 3.15747MW.

Transformers on the Ibie feeder are made by various manufacturers (i.e Siemens, ABB, etc). In computing the transformer losses on the Ibie feeder, average of the Load and No-load on the Table 2 and Table 3 were used for computing the transformer losses on the Ibie feeder. Table 4 and 5 is a Siemens transformer and specification for transformer with voltage ratio of 11/0.433kVA. This is within reach of transformer specification in Nigeria power industry. Table 6 shows the average Load and No-load losses of selected transformer ratings.

.

Table 1: Estimate Losses (MW) from May 2014 to March 2015

Month	**Year**	**Loss (MW)**
May	2014	0.24818
June	2014	0.21213
July	2014	0.18645
August	2014	0.19482
September	2014	0.18645
October	2014	0.16242
November	2014	0.17024
December	2014	0.18645
January	2015	0.07218
February	2015	0.09428
March	2015	0.01128

Source;BEDC Auchi .

Table 2: Load and No-Load losses of selected Siemens transformer ratings

Transformer rating (kVA)	**Loss combination**	**No-Load loss (W)**	**Load loss (W)**
50	A-A′	190	1100
100	A-A′	320	1750
160	A-A′	460	2350
250	A-A′	650	3250
400	A-A′	930	4600
630	A-A′	1200	6750

Source;pabla.A.S (2004)

Table 3: Standard specification for maximum losses in distribution transformers

Transformer rating (kVA)	**Loss combination**	**No-Load loss (W)**	**Load loss (W)**
16	11/433kV	80	475
25	11/433kV	100	685

63	11/433kV	180	1235
100	11/433kV	260,290	1760,1850
400	11/433kV	980	5500
1000	11/433kV	1800	11,000

Source: Pabla. A.S (2004)

Table 4: Average Load and No losses of selected transformer ratings

Transformer rating (kVA)	No-Load loss (W)	Load loss (W)
50	190	1100
100	290	1755
160	460	2350
400	955	5050
630	1200	6750

Table 5: Standard specification for maximum losses in distribution transformers

Transformer rating (kVA)	Loss combination	No-Load loss (W)	Load loss (W)
16	11/433kV	80	475
25	11/433kV	100	685
63	11/433kV	180	1235
100	11/433kV	260,290	1760,1850
400	11/433kV	980	5500
1000	11/433kV	1800	11,000

Source: Pabla. A.S (2004)

Table 6: Comprehensive values of transformer's Load and Non-Load Losses on Ibie feeder.

Transformer rating (kVA)	No-Load Loss (W)	Load Loss (W)	Number of transformer on feeder	Total No-Load Losses (W)	Total Load Losses (W)	Total transformer Losses (MW)
50	190	1100	1	190	1100	0.001290
100	290	1755	1	290	1755	0.002045
200	540	2750	4	2160	11000	0.01316
300	752	3850	3	2256	11550	0.013806
500	1062	5789	2	2124	11578	0.013702
Total						0.044003

TECHNICAL LOSSES (MW)

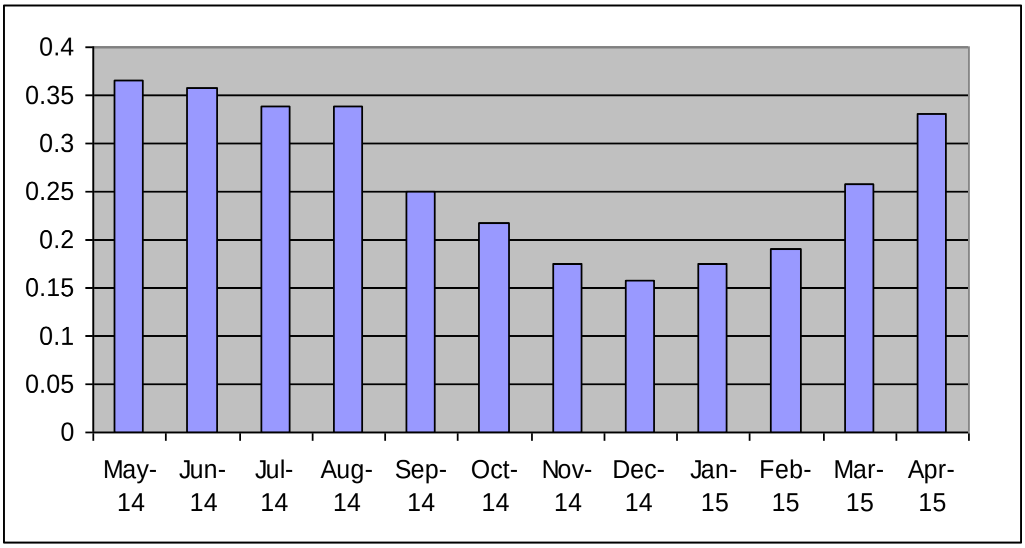


Fig.1: Variation in Technical Losses on Ibie feeder for the duration under consideration.

5. Conclusion

Losses in power system emanate from overloading and ageing of system components. The oldest transformer on Ibie feeder was manufactured 1985(Lagos road,sabo) (200kVA), Ibie feeder experiences monthly over loading for the period under consideration and load shedding. Non-technical losses are caused by loads and conditions that the technical losses computation failed to take into account, Non-Technical Losses (NTL) are nearly impossible to measure using power system analysis tools; this is due to the lack of information on both NTL and the legitimate loads in the system, which translates to insufficient inputs for any meaningful loss calculations. Electricity theft, a common form of NTL, involves tampering with meters to distort the billing information or direct connections to the power system this is very common in the student environment such as the feeder under consideration.

The obvious solution to this is to install meters at every billed load and to use meters that sample load power or voltage values at reasonable intervals.

6. Recommendation

The losses occurring on the Ibie feeder has technical and non-technical components, on this premise, we make the following recommendations:

1. The authority should employ law enforcement as a method of eradicating non technical losses
2. Transformer serving any given area should match the load associated with it, if the existing ones are over loaded, more should be added to the system to make the system more reliable.
3. The utility provider DISCO should endeavor to adopt good record keeping practices, such that important document/data should kept accurate.

References:

Aderounmu .A (2008). The biggest problem with Nigeria", February 23, 2008. Accessed Friday 13 August, 2010, www. Nigeria village square com.

Agbo, A (2007).Ending the Power Nightmare". TELL May, 2007 pp. 28-31

Anthony, P (1986): Electrical Distribution Engineering". International Edition, M cGraw-1-1lll Book Company, New York.pp 148-155

Fink.D.G., and Bealy L.W. (1978): "Standard Handbook For Electrical Engineer", Eleventh Edition, McGraw-Hill Book Company, New York. Pp 208-212

Hughes, R (2002): Electrical and electronic technology"XIII edition prentice hall.

Obadote, F.J.(2009): Paper presented at the "Power Sector Prayer Conference: Energy Crisis in Nigeria; Technical Issues and Solutions". June 25-27, 2009.

Okoro O. I. and Madueme, T.C.(2004): Solar Energy Investments in a Developing Economy". Renewable Energy, vol. 29, 2004, pp. l599-l600

Pabla, A.S (2004): Electric Power Distribution", Tata McGraw-Hill Book Company, New- Delhi

Sambo, A. S.(2008).Paper presented at the "National Workshop on the Participation of State Governments in the Power Sector: Matching Electricity Supply with Demand in Nigeria", 29 July 2008, Ladi Kwali Hall. Sheraton 1 Hotel and Towers, Abuja.Siemens transformer catalogue pp 6-9

A COMPARATIVE APPRAISAL OF ARBITRATION AGAINST OTHER ALTERNATIVE DISPUTE RESOLUTION (ADR) TECHNIQUES IN THE BUILDING INDUSTRY

BY

SUMANU SYLVANUS OMO, EBOREIME CLIFFORD OHIHOIN AND USMAN DANJUMA DANIEL MAMUD

Department of Quantity Surveying, Auchi Polytechnic, Auchi.

Abstract

The study appraised arbitration against other alternative dispute resolution (ADR) techniques in the building industry using Edo State as a case study with a view to evaluating the merits and demerits of arbitration against other alternative dispute resolution techniques. A total of 53 questionnaires from respondents were found suitable for analysis out of the 206 questionnaire administered. The data was analyzed using mean score and ranking. The result from the analysis revealed that design error, poor quality and workmanship, variation, late payment, project complexity, poor coordination, unfavourable site condition, acceleration, differing goals, poor communication and tenders are all major causes of dispute in the building industry. The study further revealed that mediation, negotiation, expert assessment, mini trial, dispute resolution board, executive tribunal and non binding adjudication in order of significant are other alternative dispute resolution (ADR) techniques available in the building industry. The study revealed that there is no significant relationship between the use of arbitration and other alternative dispute resolution (ADR) techniques and that other ADR are not effectively and efficiently used like arbitration. Based on the findings, the study recommends that Stakeholders and policy makers in the building industry should encourage resolving dispute and the likes through ADR techniques.

Keywords: Arbitration, Alternative dispute resolution techniques, Building industry

Corresponding Author's e-mail: sumanusylvanus@yahoo.com; Tel: +2348032848710

1.1: Background of the Study

Building industry is a sub-sector in the construction industry. It is defined as the sector of the economy that is responsible for the construction, alteration, modification, extension, restoration, repair, demolition or dismantling of building, structure or works that form or are to form part of land, whether or not the building structure or work are permanent. The product of the building industry includes hospitals, schools, hotels, shopping malls, industrial buildings etc. (Commonwealth Consolidated Act, 2012). Onwusonye (2005) asserts that the building industry comprises of various participant, this includes companies, firms and individuals working as consultants (design team), main contractor, sub-contractors, material producers (producer of component for construction), equipment supplier and builder merchant. The author also asserts that money, man, material and machine (4Ms) are the constructional resources and are also relevant in the building industry for an effective and satisfactory outcome, and in the management and coordination of the various participant and constructional resources therefore dispute is inevitable in such environment.

The complexity of construction project and their exposure to numerous risk result in frequent legal dispute in the building industry, dispute arising regarding various circumstances which include excess and unforeseen work and its shortfalls, completion time (delay), loss due to contract non execution, late payment, environmental conditions, natural disaster, discrepancies in contract document and others. Delay in the resolution of this dispute can be particularly damaging because it slows down the completion process of the construction work, impacts the ability to perform under various related contract and prevent the productive use of funds and time. As a result, many disputes in the building industry are settled amicably without court involvement (Litigation). This paper is clearly intended to investigate the role of arbitration in the resolution of conflicts and disputes in the building industry when compared with other alternative dispute resolution techniques within the industry.

1.2 The nature of the building industry

Building industry comprises of all those organization or persons responsible or concerned with the construction, procurement, alteration, maintenance of building works. The building industry is mainly concerned with the provision of shelter and the industry plays a vital role in the transformation of the physical terrain of any nation in its march towards greater civilization and economic independent. Gray (2006) asserts that the building industry involves various participants which include the client, the contractor and the design team. The client is the owner and financier of the project, he is anyone having construction or building works carried out. The client can either be government, individuals or corporate organization. The contractor on the other hand is an organization or individual who agrees to fulfill the terms of a legally binding agreement in the building industry, while the design team comprises of Architect, Builders, Quantity Surveyors, Civil Engineer and Service Engineers. Figure 1 shows the relationship between key participants in the construction industry.

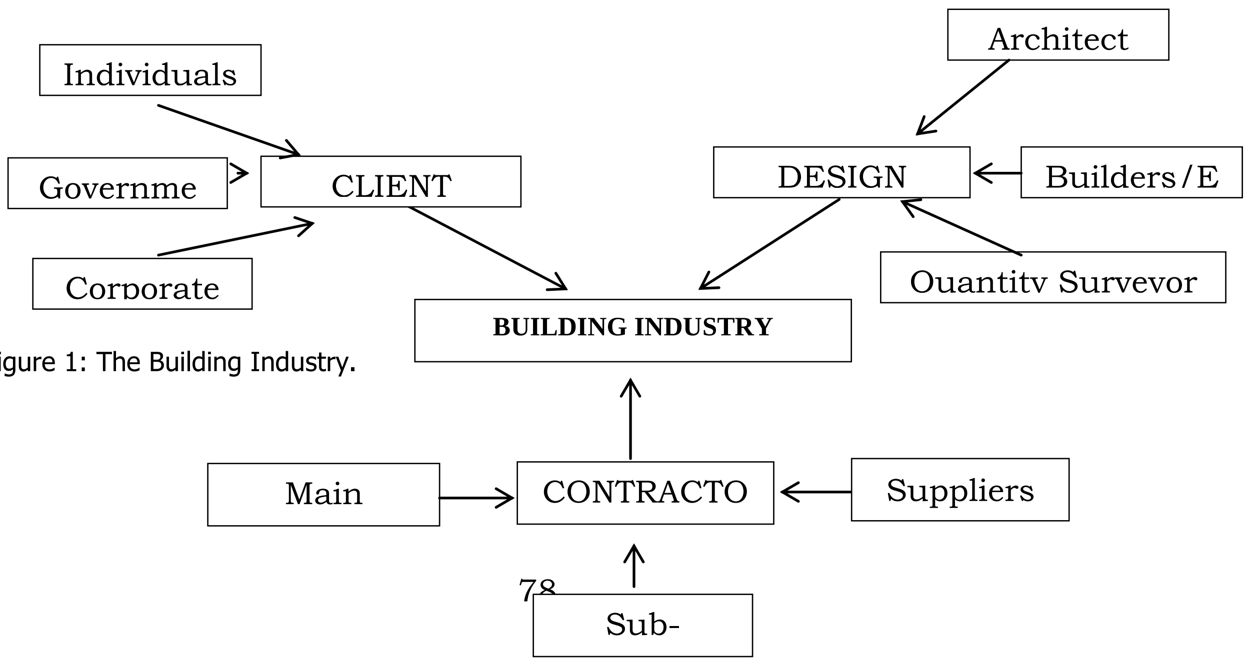


Figure 1: The Building Industry.

1.3 Causes of Dispute in the Public Sector Construction Industry

Unlike other industries such as production and manufacturing where customers can feel and test the finished product before purchase, the construction industry is different due to peculiarity and uniqueness of all projects irrespective of similarity in design, purpose and method of construction. In Cheung & Chow's study as cited by Asuoquo (2011) identified the following major causes of dispute in the construction industry as indicated in the table below

Table 1: Factors that Causes Dispute Grouped Under Four Major Categories.

Major Categories	Causes of Dispute
i). Contract and specification dispute problems	• Design error • Date of notice to proceed • Change in design • Failure of RIBA plan of work • Change in scope • Unrealistic contract condition • Change orders • Mistakes and discrepancies in design and contract documents
ii). Environmental dispute problems	• Adverse weather condition • Change in site condition • Acts of God • Unforeseen problem underground • Noise and dust
iii). Financial dispute problem	• Inaccuracy of project cost estimate • Delay in progress payment by client • Fiscal budget • Payment system of the client • Main contractor financial problem • Exchange rate • Bank policy • Fluctuation in material and labour
iv). Other dispute problems	• Lack of communication • Misunderstanding • Lack of skilled labor and engineer • Unexpected social event • Poorly done planning and scheduling • Negligence • Delay • Economic environment

Source: Borvorn, (2011)

1.4 Arbitration

Arbitration is a non-judicial legal technique for resolving disputes by referring them to a third party for a binding decision, or "Award" as arbitrator's findings are usually described. It is a process in which a third party neutral, after listening to evidence and argument from the parties in a relatively informal hearing, makes a binding decision resolving the dispute. Arbitration does not provide the parties with the same range of self-determination as in other ADR methods. Indeed, save for its informality, its speed it cost and involvement of the parties in choosing the judge, arbitration has the identical "win-loss" features when determining parties rights (Saka, 2007).

Owasanoye (2011) asserts that Halsbury's laws of England, defined arbitration as the reference of a dispute or difference between not less than two parties for determination, after hearing both sides in a judicial manner, by a person or persons other than a court of competent jurisdiction.

1.6 Methodology

Dispute in building industry is a rampant phenomenon that occurs due to the complex nature of the industry. Therefore, it concerns construction professionals, and policy makers. The selected population for this study covered major actors in public building construction projects, i.e. public contractors, consultants, and government officials involved in public project execution.

1.6.1 Sampling Frame

The adequacy of a sample is assessed by how well it represents the whole population of participants from which the sample is intended to be drawn. Table 3 shows the sampling frame of this research work.

Table 3: Sampling Frame of Respondents.

Respondents	**No of Respondents**
Architects	46
Engineers	56
Quantity Surveyors	38
Professional Builders	36
Selected Contractors	27
Selected Clients	18
Total	**221**

1.6.2 Sample Size

The sampling size in respect of the various categories of respondent was determined from the following formula used in Aje's study (as cited by Animan, 2012)

$$n = \frac{n^1}{1 + \frac{n^1}{N}}$$

Where n = sample size: n^1

N = total population, the sample size for the study population and their respective locations are as shown in Table 4.

Table 4: Sample Size of Respondents.

Respondents	No of Respondents
Architects	44
Engineers	53
Quantity Surveyors	36
Professional Builders	34
Selected Contractors	24
Selected Clients	15
Total	206

1.7 Method of Data Analysis

The responses from the administered questionnaire were analyzed using mean score and ranking as presented in the tables below.

Table 5: Other Alternative Dispute Resolution Techniques in the Building Industry.

Other ADR	**5**	**4**	**3**	**2**	**1**	**Total**	**Mean score**	**Rank**
Mediation	36	11	3	3	0	53	4.50	1st
Negotiation	21	19	7	3	3	53	3.98	2nd
Expert assessment	17	7	21	3	5	53	3.53	3rd
Mini trial	12	10	17	6	8	53	3.22	4th
Dispute resolution board	18	2	15	8	10	53	3.19	5th
Executive tribunal	9	14	13	11	6	53	3.17	6th
Non binding adjudication	3	14	10	17	9	53	2.15	7th

Table 5 identified other Alternative Dispute Resolution techniques available in the building industry, the result shows that the other major Alternative Dispute Resolution techniques available in the building industry are: Mediation, negotiation, expert assessment and mini trial. Others are dispute resolution board, executive tribunal and non binding adjudication. This agrees with Saka (2007).

Table 6: Merit of other Alternative Dispute Resolution Techniques over Arbitration in the Building Industry.

Merits of other ADR over Arbitration	**5**	**4**	**3**	**2**	**1**	**Total**	**Mean score**	**Rank**
Much cheaper than arbitration	41	4	5	3	0	53	4.57	1st
More time efficient than arbitration	37	5	5	6	0	53	4.38	2nd
More formal than arbitration	33	10	4	5	1	53	4.30	3rd
More flexible than arbitration	27	7	8	8	3	53	3.88	4th
Not as complicated as arbitration	20	9	6	11	7	53	3.45	4th

Table 6 reveals the merits of other ADR over arbitration: Other ADR is cheaper than arbitration , other ADR is more time efficient , other ADR is more flexible and Other ADR are not as complicated as arbitration.

Table 7: Challenges Facing Other Alternative Dispute Resolution Techniques in the Building Industry.

Challenges facing other alternative dispute resolution techniques (ADR)	**5**	**4**	**3**	**2**	**1**	**Total**	**Mean score**	**Rank**
No guarantee that other ADR will resolve the dispute	23	18	8	4	0	53	4.13	1st
The parties want legal precedent	21	20	9	3	0	53	4.11	2nd

Parties want their case to be heard in public	19	17	11	6	0	53	3.92	3rd
Auditors or others require third party decision	14	21	15	3	0	53	3.87	4th
One of the parties not interested in settlement	20	16	7	6	4	53	3.87	4th
An adjudication is urgently required to preserve right or property	16	19	10	8	0	53	3.81	5th
No proper documentation of the case for future use	18	19	5	4	0	53	3.70	6th

Table 7 identified the challenges facing other alternative dispute resolution (ADR) techniques. No guarantee that other ADR will resolve the dispute. This also agrees with Saka (2007) who submitted that no guarantee that other ADR will resolve the dispute is one of the challenges facing other alternative dispute resolution (ADR) techniques in the building industry, other challenges are; the parties want legal precedent, auditors or others require third party decision and one of the parties not interested in settlement, an adjudication is urgently required to preserve right or property and no proper documentation of the case for future use.

Table 8: Ways Arbitration Differ from other Alternative Dispute Resolution Techniques.

ADR Identified ways arbitration differs from other techniques	3	2	1	Total	Mean score	Rank
Arbitration is slower than other ADR techniques	40	9	4	53	2.68	1st
Arbitration has powers to grant orders	40	8	5	53	2.66	2nd
Arbitration has final award enforceable as judgment	41	2	10	53	2.58	3rd
Arbitration is costlier than other ADR techniques	37	6	10	53	2.51	4th
Arbitration is riskier than other ADR techniques	31	7	15	53	2.30	5th
Arbitration has appeal on point of law	22	20	11	53	2.21	6th
Arbitration is compulsory	34	5	14	53	2.18	7th

Table 8 identified ways arbitration differ from other alternative dispute resolution techniques (ADR) : arbitration is slower than other ADR techniques , arbitration has powers to grant orders , arbitration has final award enforceable as judgment, arbitration is costlier than other ADR techniques, Arbitration is riskier than other ADR techniques , Arbitration has appeal on point of law and Arbitration is compulsory.

Table 9: Ways other Alternative Dispute Resolution Techniques Differ from Arbitration

Identified ways other ADR differ from Arbitration	3	2	1	Total	Mean score	Rank
Other ADR techniques are quicker than arbitration	47	5	1	53	2.87	1st

Other ADR techniques reduce risk	41	5	7	53	2.64	2nd
Other ADR techniques are cheaper	40	4	9	53	2.58	3rd
Other ADR techniques are voluntary	37	5	11	53	2.49	4th
Other ADR techniques have no powers to grant order	31	7	15	53	2.30	5th
Other ADR techniques have no agreement readily enforceable	31	7	15	53	2.30	5th

Table 9 Identified ways other ADR differ from Arbitration: Other ADR techniques are quicker than arbitration, Other ADR techniques reduce risk, Other ADR techniques are cheaper and this was followed by Other ADR techniques are voluntary , Other ADR techniques have no powers to grant order and Other ADR techniques have no agreement readily enforceable**.**

Table 10: Similarities between Arbitration and other Alternative Dispute Resolution Techniques.

Identified Similarities Between Arbitration and other Alternative Dispute Resolution Techniques.	**3**	**2**	**1**	**Total**	**Mean score**	**Rank**
They are both alternatives to litigation	45	4	4	53	2.77	1st
They are both applied in the construction industry	41	7	5	53	2.68	2nd
They are both less costlier than litigation	35	9	9	53	2.58	3rd

Table 10 reveals the Similarities between arbitration and other alternative dispute resolution techniques. From Table 4.15 the orders of similarities are; they are both alternatives to litigation, they are both applied in the construction industry and They are both less costlier than litigation. This agrees with Christopher & Shulman (2009) who submitted a model on the similarities between arbitration and other ADR techniques.

1.8 Conclusion

The study has been able to discuss the concept "Appraising arbitration against other alternative dispute resolution (ADR) techniques in the building industry". The study identifies the factors that causes dispute in the building industry which is significant to the causes of dispute in the building industry and this has no positive effect on the building industry. Also, the study identifies the benefits of other alternative dispute resolution (ADR) techniques available in the building industry and that other alternative dispute resolution (ADR) techniques are not effectively used frequently like arbitration. It is therefore concluded that there are significant causes of dispute in the building industry,. Also there are other effective alternative dispute resolution (ADR) techniques available in the building industry and that there is no significant relationship between the use of arbitration and other alternative dispute resolution techniques and that other alternative dispute resolution (ADR) are not effectively used frequently as arbitration.

1.9 Recommendations

The study succeeded in establishing that there is no significant relationship between the use of arbitration and other alternative dispute resolution (ADR) techniques i.e. other alternative dispute resolution techniques are not fully utilized in the settling of construction related dispute. Therefore there is need for all professional bodies and regulatory agencies to create more awareness on the use and benefits of other alternative dispute resolution techniques. Also seminars, workshop and seminars should be organized on the use, benefits and application of other alternative dispute resolution (ADR) techniques in the settlement of dispute in the building industry.

REFERENCES

Adedoyin, R. V. (2013). *Arbitration and alternative dispute resolution as instrument for economic reform*. Lagos, Nigeria: Bright Publishing Co.

Animam, O. J. (2012). *Impact of Risk Management On Construction Building Projects in Nigeria*. An Essay Project Submitted for the Award of Higher National Diploma (HND) in the Department of Quantity Surveying, Auchi Polytechnic, Auchi.

Asuquo, I. (2011). *A Study On Causes and Effects Of Disputes In Public Private Partnership/Private Finance Initiatives PPPP/PFI Projects In Nigeria.* A dissertation submitted in partial of the requirement for the degree of MSc in Quantity Surveying, Heriot-Watt University, UK.

.

Borvorn, I. (2011). *Appraisal of Common Dispute Problems over Residential Building Projects in Hong Kong,.* Thailand: Marrakech press.

Christopher, P. & Shulman, A. (2006). *Dispute resolution mechanism*. Cape Town, South Africa: Vast Publication.

Common Wealth (2012). *Common Wealth Consolidated Act*. Retrieved April 5th, from http//www.commonwealth.org/website/dispute.

Gray, V. (2006). The negative side of litigation and its effects. *Journal of Dispute settlement* 102 (11), 7-8.

Hilldickson, K. (2009). *Introduction to alternative dispute resolution.* Hill View vol.12. Retrieved August 7th 2013, from http//www.hilldickson.com/./242-disputes.html.

Owasanoye, B. (2011). Arbitration and *Alternate Dispute resolution*. Lagos, Nigeria Unitar group.

Saka, N. (2007). *Torts and Dispute Resolution Techniques in Construction*. (1st Ed). Akure, Nigeria: Stanford Publishing.

ECONOMIC DEPENDENCY AND UNDERDEVELOPMENT OF AFRICA: THE NIGERIAN EXPERIENCE

BY

AMEDU MISHAU
Department of Humanities and Social Sciences, School of General Studies,
Auchi Polytechnic, Auchi,
Email:ahmedumishau67@yahoo.com
08063364442

UMORU SEDIKU MUSA
Department of Mass Commutation,
Auchi Polytechnic, Auchi, Edo State-Nigeria.
Email:umorusediku@gmail.com
07034434950

YUSUF M. ABDULRAZZAQ
Department of Adult Education and Community Services,
Bayero University, Kano-Nigeira:
Email:abdulyufm@gmail.com
07031385261

Abstract
The paper critically examines economic dependency and underdevelopment of Africa; the Nigeria experience. In an attempt to achieve this, clarification of concepts like development, dependency theory and modernization theory were carried out, which formed the theoretical basis of the analysis. It was discovered that a number of issues such as corruption and mismanagement, faulty planning from above rather than bottom-up pursuance of the colonial and neo-colonial economic and social policies which are anti-people, among other factors, led to failure of development efforts in Nigeria and Africa, by extension. The paper therefore, concludes, among other things, that for rapid and sustainable development to take place, Nigeria must look inwards and vigorously pursue policy of self-reliance through bottom-up approach, and change the orientation of all and sundry, particularly the leadership class in Nigeria in order to minimize corruption and mismanagement of resources. It also emphasizes the need for a paradigm shift in the development orientation if Africa is to reclaim its right to chart a new way to development.

Introduction

Africa houses plentiful economic resources. Paradoxically, the continent languishes in poverty as evidenced by high prevalence of famine, disease and ignorance (Buthelezi, 2007 cited in Matunhu, 2011). According to Rodney (1972), the colonial conquest that followed the 1884 to 1885 Berlin Conference (partition of Africa) established a comprehensive economic and political domination of Africa by the West. Africa's endogenous development path was discarded in favour of an 'external driven development path' which was and is still manipulated by the metropolis.

Nigeria gained independence in 1960 from the British colonial government. Ever since then, national development has been declared a priority by the successive governments, be it civilian or military. In this regard, several organizations, institutions and agencies have been set up to undertake and monitor the complicated process of nation-building, development and integration. After sixty-five years of independence, Nigeria's economy still suffers balance of payment deficit, as the dependency syndrome has overwhelmed her mentality to remain a consumer nation rather than a producing nation This post-colonial orientation is a replication of the erstwhile colonial arrangement whereby development efforts were all aimed at opening the rural communities in Nigeria as a link for the easy exploitation of export raw materials and a dumping ground for foreign made products. Countries that export mostly raw materials hardly get industrialized. Therefore, Economic development cannot be attained by mere exportation of raw materials.

In Nigeria, over the years, the stated objectives and strategies for national development have been pronounced by policy-makers and those concerned with the issue of development. But there still exists enormous gap between policy formulation and implementation and the reality of the level of the national development. The thrust of this paper, therefore, is to examine economic dependency in Africa and Nigeria's development challenges. We intend to establish the cause of underdevelopment in African countries inspite of their enormous human and material endowments. It is further argued that the bane of Nigeria's development process is the neo-colonial, dependent economic system operating in the country.

Conceptual Clarification

Development

The concept of development is very difficult to define because it is value loaded. It is often equated with economic growth or economic development. Indeed the two concepts are often used interchangeably, but they do not mean the same thing. Economic development is an essential component of development, yet it is not the only one. There are many other aspects of development. According to Rodney (1972: 9), "development" is "a many-side process. At the level of the individuals, it implies increased skills and capacity, greater freedom, creativity, self-discipline, responsibility and material wellbeing". On the other hand Todaro (1977: 96-98) says that:

> Development must therefore be conceived as a multi-dimensional process involving changes in structure, attitudes and institutions, as well as the acceleration of economic growth, the reduction of inequality and the eradication of absolute poverty. In essence, development must represent the entire gamut of changes by which the entire social system, turned to the diverse basic needs and desires of individuals and social groups within the system moves away from the conditions of life regarded as materially and spiritually "better".

This means that development involves the reorganization and reorientation of the entire economic and social system. This also involves, in addition to improvement of income and output, radical changes in institutions, social and administrative structures as well as in popular attitudes, customs and beliefs.

The implication of these two definitions is that "development" goes beyond economic indicators. It is both a physical process and a state of mind. The institutions or structures like construction of railways, schools, hospital, etc are aspects of development. The second aspect of development is that the people must change their attitudes for good.

Also, Seers (1969: 3) asked certain questions regarding the concept of development. He says that: The questions to ask about a country's development are: what has been happening to poverty? What has been happening to unemployment? What has been happening to inequality? If all three of these have declined from high levels, then beyond doubt, this has been a period of development for the country concerned.

If one or two of these problems have been growing worse, especially if all three have, it would be strange to call the result development even if per capita income doubled. It, therefore, means that development, per se, cannot be tied to economic advancement only but a general improvement in the living conditions of the people over time. Development is also aimed at improving the living conditions of the people through the effective management of both the human and materials resources. Thus, Gana (1986: 2) cited in Enyi (2014) noted that "Development concerns the capacity and creative capability of a people to effectively transform the natural resources of their environment into goods and services through the imaginative and practical application of their creative talent and productive power".

This implies that the people must be empowered to be able to meet their basic needs of food, housing, health, transport, education, employment, reduction in poverty level and increased per capita income among others. This is what is lacking in the rural areas of Nigeria and elsewhere in Africa where about eighty percent of the population live in the rural areas.

A critical examination of the definition of "development" by the scholars quoted above means that "development" must necessarily include the reduction or elimination of poverty, illiteracy, disease, malnutrition, joblessness, etc. It is a programme which has the objective and strategy aimed at transforming the citizens from being the victims of poverty, ignorance and disease into contented human begins, able to earn an income capable of sustaining a reasonable standard of living for themselves and their families. It also means the ability to provide the basic necessities of life such as food, jobs, affordable and accessible health-care, good roads, water, electricity and education, among many other things for the people.

Modernization Theory

The concept of modernization incorporates the full spectrum of the transition and drastic transformation that a traditional society has to undergo in order to become modern (Hussain et al., 1981; Lenin, 1964). Modernisation is about Africa following the developmental footsteps of Europe (largely the former colonizer of Africa).

Modernization is a policy intended to raise the standard of living of the poor often consist of disseminating knowledge and information about more efficient techniques of production. For instance, the agriculture modemisation process involves encouraging farmers to try new crops, new production methods and new marketing skills (Ellis and Biggs, 2001) cited in (Matunhu, 2011). In general, modernization led to the introduction of hybrids, the green house technology, genetically modified (GMO) food, use of artificial fertilizers, insecticides, tractors and the application of other scientific knowledge to replace traditional agricultural practices.

The above view is endorsed by Smith who pointed out that modernisation is about exchanging of older agriculture practices with something more recent (Smith, 1973: 61 cited in Matunhu, 2011). This depicts modernization as a process of change whereby external factors have an impact on the individual and on culture. In this case, modernization of a person needs to provide motivation, to go along with the changing social and economic situation.

The theory is criticized for failing to consider the poor as the centerpiece in poverty reduction initiatives. By ignoring the involvement and participation of the target community, these communities receive the marginalization of their commitment, creativity and support of the intervention strategies. The intervention strategy becomes an imposed strategy and such a strategy fails to construct adequate notions of both the causal powers of social structures and the role of human agency in shaping social relations in general (Wikipedia, 2018).

Economic Dependency Theory

Dependency can be defined as an explanation of the economic development of a state in terms of the external influences (political, economic, and cultural) on national development policies (Sunkel, 1969). Theotonio Dos Santos emphasizes the historical dimension of the dependency relationships in his definition when he wrote:

> Dependency is ... an historical condition which shapes a certain structure of the world economy such that it favours some countries to the detriment of others and limits the development possibilities of the subordinate economics ... a situation in which the economy of a certain group of countries is conditioned by the development and expansion of another economy, to which their own is subjected (Dos Santos, 1971: 4) cited in (Uwazie, Igwemma and Llkah, 2015: 29).

There are three common features to these definitions which most dependency theorists share. First, dependency characterizes the international system as comprised of two sets of states, variously described as dominant/dependent, centre/periphery or metropolitan/satellite. The dominant states are the advanced industrial nations in the organization of Economic Cooperation and Development (OECD). The dependent states are those states of Latin America, Asia, and Africa which have low per capita GNPs and which rely heavily on the export of a single commodity for foreign exchange earrings, and the importation of variety of goods from the western developed dominant states.

Second, both definitions have in common the assumption that external forces are of singular importance to the economic activities within the dependent states. These external forces include multinational corporations, international commodity markets, foreign assistance, communications, and any other means by which the advanced industrialized countries can represent their economic interest abroad.

Third, the definitions of dependency indicate that the relations between dominant and dependent states are dynamic because the interactions between the two sets of states tend to not only reinforce but also intensify the unequal patterns. Moreover, dependency is a very deep-seated historical process, rooted in the internationalization of capitalism. Dependency, scholars still argue, is an on-going process.

Simply put, dependency theory attempts to explain the present underdeveloped state of many nations in the world by examining the patterns of interactions among nations and by arguing that inequality among nations is an intrinsic part of those interactions.

Economic Dependency in Africa

Social anthropologists consider the dependency theory to be both pessimistic and structural. At macro level, the main premise of the structural dependency theory is that it would be impossible to understand the processes and problems of Africa without considering the wider socio-historical context of Western European expansion (industrial and mercantile capitalism) and the colonization of these places by the Western economies (Frank, 1969). According to Rodney (1972), colonialism was not merely a system of exploitation, but one whose essential purpose was to repatriate the profits made in Africa to the so called home land. From a dependency perspective, repatriation of profits represents a systematic expatriation of the surplus values that were created by African labour using African resources.

Hence, the development of Europe can be viewed as part of the same dialectical processes that underdeveloped Africa. In other words, the domination of Europe over Africa retarded the economic development of the continent. For five running centuries, Europe capitalized on its encounter with Africa. The above situation is succinctly expressed by Rodney (1972: 149) whose analysis of the relationship between Europe and Africa is that during colonialism, Europe organized herself, accumulated capital gained from her colonies in Africa, shrewdly invested the surplus in productive economy, steadfastly increasing national wealth and riches for its people. Africa was and continues to be dominated economically as well as politically by external centres of power. Most noticeable here is the economic, political and cultural dependence of the continent upon America and Europe.

The dependence is also noticeable between rural areas and urban areas. Writing about the situation in Southern Africa, Samira et al (1987: 2) noted: "Imperialists partitioned the countries in Africa and then forced the African peasantry into reserves, deliberately planned to be inadequate for the purposes of ensuring the failure of subsistence in earlier traditional forms. The discovery of the mineral riches of Southern Africa (such as gold and diamonds in South Africa, copper in Katanga in Zambia) just when capitalism was entering a new stage of monopolistic expansion inspired a particular form of colonization of the economy of the reserves". The above contribution shows that while Europe and America are busy exploiting Africa; the urban areas are also busy exploiting their rural areas. Within those rural areas, one finds rich people exploiting poor individuals and the chain goes on and on.

Therefore, dependency may loosely be viewed as linear and multi-staged. The economic development of rural areas signifies the establishment of metropolitan-satellite relationship at different levels in the socio-economic structure of the economy. The relationship is based upon regional control of economic and political resources between regions, sectors of the economy and different social groups (Nyerere, 1973; Gabriel, 1991). Accordingly, the underdevelopment of Lower Gweru, Chibi, Mhondoro Chirumanzi and many more districts in Zimbabwe and Amathole District in South Africa is squarely a result of this exploitation.

In the same vein, the poverty of an individual worker is a result of the exploitation of that particular individual by the system or the employer. Thus poverty at all levels is attributable to inhibiting relationships (internal colonialism) between the developed communities (urban areas) and their satellites (rural areas) and also between individuals with different economic powers. The relationship is one in which a metropolis or center exerts pressure upon its satellite or periphery.

According to Galtung (1980), South Africa has become an external sector of the North Europe - a source of materials, cheap labour and educated people (through brain drain). The pillage of resources from Africa continues to exacerbate poverty on the continent and rural communities suffer the most. Notably, Africa deprived by Europe of politic and economic decision power, and lacking sustained investment funds, trod the reverse path, sinking deeper and deeper into the ocean of underdevelopment and poverty (Rodney, 1972).

The dependency theory has made Africa a dump for waste and excess labour and a market where the terms of trade work to the advantage of the developed world. For instance, Africa is positioned to specialize in marketing raw materials while the developed world market finished products. There is no convincing explanation to why Africa is not manufacturing airplanes considering that the continent has aluminum and copper which can be alloyed for aircraft construction. It would be grossly unfair to think that Africa has not always been a victim of external influence. On the contrary, African leaders have allowed the developed countries to exploit it. For instance, by signing the World Trade Organisation (WTO) agreements in 1995, Africa has abdicated a lot of its power to map its way to development.

The basic message of dependency school of thought is that the development of the metropolis was a result of the active underdevelopment of the non-metropolis communities. Put differently, the metropolis is dependent for its development on the underdevelopment of its satellite. For instance, human capital has flowed and continues to move away from Africa to the developed world. Rodney (1972) rightly noted that during the pre-colonial period; from mid fifteenth century to the end of the nineteenth century, Africa was cornered into the selling human beings (shipped as slaves to toil on European cotton and sugar cane plantations in America) in exchange for rubbish such as overpriced bottled alcohol.

The extraction of human resources out of Africa did not end with the end of slavery. According to Ndulu (2004), since 1994, about 1.6 million South African people in skilled, professional and managerial occupations have emigrated and the country lost 25% of its Economic Dependency and inter-development of Africa: Looking at the Nigeria experience, graduates migrating to the USA alone accounts for 9.7% of all international medical graduates practicing in Canada.

Notably, the origin of the concept, 'underdevelopment' was questioned by Frank who conceptualized the term, 'development of the underdeveloped' as meaning that, "underdevelopment is not an original state; rather, it's a result of economic capture and control of backward regions by advanced metropolitan capitalism" (Frank, 1967: 25). Writing about the situation in Southern Africa, Samira Amin, Chitala and Mandaza (1987: 2) noted, "For a century, imperialism had established a system of total domination of Southern African region in which the white settler colony of South Africa played a key role. The apartheid regime in South Africa was thus always an intrinsic part of this form of the expansion of periphery capitalism.

Therefore Africa's poverty is not natural but an engineered position. It was a result of a protracted capitalistic dominance by the metropolis. Similarly, the poverty and underdevelopment in most rural areas in Africa is a result of the inhibiting relationship between them and the urban areas.

To succeed in the impoverishment operation, the metropolis destroyed the traditional, pre-capitalist structures of Africa in order to pave the way for super expropriation and appropriation of surplus value. Missionary education curriculum was the main instrument used to destroy the pre-capitalist social structures in Africa. The education system brought about mental impoverishment of Africans by deemphasizing the importance of African values and culture, at the same time, glorifying that of the whites. The basic idea was to disorient the minds and identity of the blacks. The process of brain-washing the Africans created a fertile ground for the exploitation of the continent's human and non-human resources. There cannot be an argument over the fact that the dependency theory is exploitative hence impoverishing. In this regard, Gabriel (1991) argues that the amount of surplus value appropriable by the metropolis from Africa depended and continues to depend not on the underdevelopment of the satellite, but on the development of the metropolis.

Dependency and world- system theories blame exploitation by the core for Africa's current problems. In the words of Andre Gunder Frank, the proponent of dependency theory:"the lemon was squeezed dry and then discarded". But this is very dubious conclusion because Ayittey (1998) places most of the blame on sub-Saharan Africa's internal problems, as does Castells (1998). Both traced Africa's massive problems to what they call the "predatory" or "vampire" state characteristics of so many African societies. Dishonesty, thievery, embezzlement, and the like are everywhere.

The political institutions that are crucial parts of states — for example, the military, police forces, the civil service, parliaments, and judiciaries — have suffered a kind of debauchery. Parliaments either do not exist or are little but charades. Political dictators have staffed each of these institutions with their own tribesmen who will be completely at their beck and call. There is little or no professionalism and accountability in any of these institutions. However, Ayittey (1998) argues that, although Africa's problems are mostly of internal origin, the west has magnified them. Western leaders, he says, have been seduced by despots. They have often supported pro-capitalist African dictators and supplied them with economic and military aids. Ayittey (1998) also notes that American blacks have often praised African leaders and failed to realize the horrendous actions these leaders were engaged in.

The dependency theory is also top-down development model in that it assumes that the locals do not have the expertise and ability to fight their poverty.

Implications of Economic Dependency on Nigeria Underdevelopment Situation

Writing on "Nigeria at 48 Still Underdeveloped", Eranga (2008) cited in Uwazie, Igwemma and Ukah (2015), observed that Nigeria is besieged with huge debt burden and foreign exchange problems. Also her economy is in a state of near-collapse. According to Arizona — Ogwu, (2008) cited in Uwazie, Igwemma and Ukah (2015):

> The performance or state of a nation's economy also attests as to whether such a nation falls under the rubrics of developed world or not. A perpetual feature of the economy of a typical underdeveloped or developing nation is that of unequal foreign exchange rates, inflation and an economy that is under a heavy debt burden. Having borrowed so much from the western nations, the economies of underdeveloped or developing countries have become appendages of western

capitalist order such that underdeveloped nations are continuously expropriated and exploited.

The above description represents the true picture of the Nigerian economy. This is the implication of Andre Gunder Frank's theory of Dependency on the economy of Nigeria. This is implicit on the fact that, despite the debt cancellation by some world bodies, Nigeria still owes huge debts. According to the Debt Management Office of Nigeria (DMON) cited in (Vanguard Newspaper 17th February 2017), Nigeria's total debt profile stood at $57.39billion. Inflation is on the increase day in and day out, reaching to its peak when it was rated at 17.26 percent March 2017 (CBN March, 2017). According to National Bureau of Statistics (NBS), the high unemployment rate of 14.2 percent in the fourth quarter of 2016.

Economic Dependency and Underdevelopment of Africa: Nigeria Experience has ravaged the economy to the extent that it has been said that about 64 million Nigerian graduates are unemployed as can be seen by the teeming millions of Nigeria youths roaming the streets in despair. Majority of them are joining crime and other social vices to make ends meet as they must feed, clothe, have a shelter over their head and fend for their immediate families. These factors are indicators of underdevelopment.

The Nigerian economy presently is characterized by galloping inflation, unequal foreign exchange rate exasperated by devalued currency and persistent dependence on importation, widespread unemployment, dilapidated infrastructures exemplified in the nature of the Nigeria roads and poor state of Nigerian hospitals, epileptic power supply that has helped cripple all aspects of the societal survival possibilities, near death state of the educational sector leading to an unavoidable brain drain (Uwazie, lgwemma and Ukah, 2015).

Entrepreneurship had died because corruption in the system has left nothing to desire in hard work and labour as youths are now concerned with money-making, irrespective of how it comes and who gets hurt in the process. Hard work, diligence and honesty have been dethroned and dishonesty and greed is enthroned. This is why merit has died in Nigeria making way for mediocrity. Below are other factors that have kept Nigeria down. These factors are as follows, apart from Achebe's one dimensional factor of Nigeria's problem of leadership (Uwazie, Igwemma and Ukah, 2015).

Although Nigeria has made some progress in terms of ensuring technological growth, she is still lagging behind many developed or near- developed countries. In the words of Fayemi (2010) cited in (Uwazie, Igwemma and Ukah, 2015), "the development of today's society is assessed according to the technological know-how available to it, hence the common place dictum, "no technological growth no development". Nigeria, as a country, has a low record of technological growth and so is regarded as under-developed. Other indices of underdevelopment and which are very obvious in the Nigerian situation include injustice, materialism, the cult of mediocrity, official corruption, emotional slavery, political immaturity, lust for power and intolerance. Injustice is still very much prevalent in the Nigerian economy. Persons awaiting trial are detained for months before they are taken to court for trails.

The one that has taken the centre stage of our political scenario is Cult of Mediocrity. This is mostly seen in form of nepotism, tribalism and favouritism. Mediocrity, in this paper, is defined as situation whereby a person is given something or a position not because he merits it but because of family or friendship ties. By the time this happens in the different key sectors of an economy, the economy will be seen parading a work force full of mediocrity. This is the true situation in Nigeria which Okoli (2003) called cognitive melodrama.

Embezzlement of public funds has characterized the government of Nigeria. State governors embezzle money from the state treasuries and take it to foreign countries to deposit; this they do while their states are crying for development. Local government chairmen have joined ranks with the governors in this mad rush for state and local government loot without recourse to the state of affairs in their place of administration, leading to societal economic quagmire. The poor are continually being oppressed by the rich. This is referred to as economic slavery. Most companies pay workers peanuts; this is a form of economic slavery. Karl Marx calls it the theory of surplus value.

Nigeria electoral system has always been going through reformation. That is to say that the system has always been dysfunctional and this affected the political maturity of the country. A political office holder that won election through rigging will tend to live with an "I don't care attitude". This is what is being seen in Nigeria today. Rigging of election is promoted by lust for power while political and business assassinations are as a result of intolerance. This is what Don Santos called Elite Complicity in rendering a naturally blessed nation underdeveloped. This Elite

Complicity is still related with Achebe's Leadership problems in Nigeria which is the prime factor in Nigeria's underdevelopment scenario.

This is the point we intend to bring out that even though A.G. Franks Dependency theory, to a large extent, is a truism even in the Nigeria political scenario, breaking the ties, as he proposed, is not the solution, as it does not checkmate and correct the issue of leadership problem. Salimu (1998), wring on a history of capitalist 'underdevelopment', averred that Nigeria, with its oil wealth, is different from many other neo-colonial countries as the majority of the ruling elite do not really care about developing the manufacturing or agricultural sectors of the economy. But, apart from a brief period in the 1970s and very early 1980s, oil has not benefited the majority up till today. While income per person grew at 3.3% a year between 1956 and 1966, in the whole period since the 1973 oil price rise, the average figure has been below 0.02%. Despite 30 years of oil exports worth over $225bn, the annual average per capita income today is around $280 which is not higher than that before the oil boom. (Uwazie, 2004 cited in Uwazie, Igwemma and Ukah, 2015).

For a time, the oil boom boosted the economy, but between 1975 and 1980, the economy grew by a real 6% -7% per year. But this came to an end in 1981. Between 1981 and 1983, Nigeria's GDP fell by 12.1%. The subsequent years of crisis have revealed how Nigeria, like all neo-colonial countries, was not able to independently develop its economy.

Over 150 million people and enormous natural resources, has a greater economic potential than any European country. But competition from already developed nations and the imperialist controlled world market, as well as elite complicity, have prevented any possible sustained development of the economy.

Reasons Why Nigeria is Still Classified as a Third World Country

There are many reasons why Nigeria is still referred to as third world country in spite of her abundant natural and human resources. These include corruption and fraudulent practices, conflict, lack of security, over-dependent on agriculture, mono-economic factor, poor leadership and neglect of education that has led to fallen standard of education. These problems will be discussed in turn:

1. **Problem of Leadership:**

   Nigeria has ever been faced with the problem of leadership; this has left the country crawling on her kneels in spite of the abundant resources. Nigeria has witnessed several transitions of governments with one regime leaving one problem or another that have dragged the country ever since independence; the military especially did more damage in terms of leadership than any even though the fourth republic is on-going and we virtually don't understand what is hidden in the bag for Nigeria. Good leaders are made, not born. If you have the desire and will-power, you can become an effective leader. Good leaders develop through a never ending process of self-study, education, training, and experience. Nigeria needs good and effective leaders to function and to move forward; the leadership determines lots of things in terms of progress.

   The failure of Nigerian leaders to establish good governments, forge national integration and promote economic progress has led to mass poverty and unemployment, and the resultant communal, ethnic, religious and class conflicts. In our analysis of why Nigeria has been crawling annoyingly while it should be running fast after Independence, we submit that the failure of leadership is the greatest obstacle to the desired growth — political and economic.

2. **Corruption and Fraud:**

   Just like the leadership problem, corruption has eaten deep into the marrow of Nigeria such that development has been hampered, no wonder Nigeria is still seen as a third world country. There are many unresolved problems in Nigeria, but the issue of the upsurge of corruption is troubling. And the damage it has done to the polity is astronomical. The menace of corruption leads to slow movement of files in offices, police extortion tollgates and slow traffic on the highways, port congestion, queues at passport offices and gas stations, ghost workers syndrome, election irregularities, among others.

   The effect of corruption on education comes from the fact that the government spends relatively more on items to make room for graft (Lipset & Lenz, 2002). Corrupt government officials would shift government expenditures to areas in which they can collect bribes easily. Large and hard-to-manage projects, such as airports or highways, make fraud easy. In addition, poverty and income inequalities are tied to corruption (Lipset & Lenz 2000).

3. **Education and Poverty:**

   Development is measured with some yardsticks known as economic indices; when these indices don't measure up to standard, then there is a problem. Poverty is then one of the indices and it has been measured that an average Nigerian lives below average (earns and spends less than a dollar a day). Education, on the other hand, contributes significantly to development but the failure of our leaders to effectively monitor and maintain education in the country has led to fallen standard of education in Nigeria. Development may be difficult in poor countries without qualitative and quantitative education.

   Also, it may be difficult for a country to achieve economic development through education, if a high percentage of the population is living below or at poverty level, with series of hygiene problems. This results into poor feeding, housing and medical care, which are the characteristics of low-income third world, underdeveloped, less developed or developing countries. A country is said to be poor if she cannot cater for her citizenry, and lives in fear or lacks basic necessities of life. One basic thing about poverty is "it is ever-ready to gulp any amount or material in it" (Dukor, 1995: 28).

4. **Mono-Culture Economic System:**

   A country operating a mono-cultural economic system may be poor. Nigeria, since early 1970's, has moved away from agriculture primarily to the production of crude oil, a commodity whose price can only be determined by foreign countries. Price mechanism has no direct control of the production and distribution of crude oil. According to Asemota (1999: 3), "the oil sector which is dominated by the government is in a state of decay due to poor operating conditions and inadequate funding, vandalization and bureaucratic interventions". Public organisations in Nigeria enjoy monopoly status that hampers development rather than fostering it."

5. **Conflict and Lack of Peace:**

   One factor that has rendered Nigeria a third world country in spite of her development efforts is conflict which has ravaged several economic states in Nigeria. Foreign investors have refused to come in to invest, claiming that lives and properties are not safe. Foreign workers (expatriates) are kidnapped every time, especially in the Niger-Delta region. Several political conflicts, religious conflicts, amongst many, will not allow Nigeria grow past the present developmental level.

   Presently, it is Boko-Haram insurgents that have been disturbing the peace of Nigeria, bombing everywhere, even the government house is not secured from these people. Both foreigners and Nigerians alike fear for their lives and continually live in fear and panic; how then can there be development?

Conclusion

Dependency theory depicts underdevelopment situations in the third world which Nigeria is a part of. It rose out of criticism of W.W. Rostow's Modernization theory, maintaining that there is a relationship between the developed and the underdeveloped countries of the world and that this relationship enriches the already developed countries and at the same time impoverishes the underdeveloped countries of the third world such as Nigeria. Dependency is in many forms but the most important is the trans-national corporations that engage in extensive economic investments in the third world, which leads to exploitation through reparation of surpluses/gains/profits, structural distortion, market vulnerability and elite complicity, involvement and connivance.

Again, there is the elite complicity, which of course, is a common theme in dependency theory writings which claims that the rich capitalists of the third world countries enter into various types of agreement with the rich core capitalists to maintain the status quo of the underdeveloped countries.

From the above, we, therefore, submit that dependency, per se, is not sacrosanct in explaining underdevelopment in the third worlds such as Nigeria, as there are other factors such as poor leadership, corruption, disregard for rule of law, low level technological advancement, non-availability of sound education, greed, materialism, etc. In the final analysis, there is the need for change of attitude on the part of the citizenry, particularly public office-holders, to embrace the virtues of hard work, commitment, integrity transparency, selflessness and accountability in the conduct of government business. It is then, and only then, that development in Nigeria will become a reality.

Recommendations

Having done a critical review of dependency syndrome and its implications on Africa's underdevelopment and Nigeria's underdevelopment situation, the paper, therefore, recommends:

- A break of the ties with the western developed nations, keeping the advantages derived from such relationship. This is because for any nation to survive, it must have a relationship with other nations but not depend on them. Socioeconomic dependence renders African countries to being subordinate and subservient instead of being complementary partners. We recommend a gradual break because for every relationship, there is a gain. In the case of Nigeria, the gains accrue to the elites who are the political and public office holders both past and present. Therefore, an inclusive development policy needs to be pursued for a balanced development to be possible.

- A pursuit of internal growth policies by paying attention to our peculiarities and socio-cultural, economic and political environment; yet a model is required from other countries that have likely or similar political, economic, social and cultural environment with us (Nigeria). This is to ensure that the unhealthy relationship between the developed and the underdeveloped countries of the third world such as Nigeria can be eradicated or at least, minimized. Yet, this internal growth policy will yield no expected dividend unless a thorough review of the political landscape of Nigeria is made.

- Government should create the enabling environment which will foster rural and community development in Nigeria. Facilities such as education, health services, electricity supply, etc that improves literacy, health and general quality of life should be provided in sufficient quantities.

- Government should intensify the crusade against corruption by repositioning relevant institutions like EFCC, ICPC and others for optimum performance. This also requires attitudinal change of the political leaders to deal with the endemic situation squarely. Therefore, the Nigerian state should make deliberate efforts to create virile and credible institutions and structures that would enhance national development

References

Asemota, S. A. (1999). Social Justice — the Right of the Poor. *A paper presented at the Annual National Conference of the Society of St. Vincent De Paul* held at the Holy Cross Cathedral Benin-City. 6th - 9th May.

Ayittey, G. (1998). Africa in Chaos: A Detailed Analysis of the Massive Economic and Political Problems in Nigeria. In *Journal of Social Science Research.*

Castells (1996, 1998). Insightful Analysis of all Three Major Regions of the Less-developed World and Their Relationship to Global Capitalism in the Current Era. On net.

CBN (2017), Inflation Rate in Nigeria. Retrieved from: https://www.cbn.gov.nglrates/inflrates.asp. on 2nd August, 2017.

Dukor, R. O. (1995). An address presented by the Metropolitan Council of Society of St.Vincent De Paul. On *the Inauguration Ceremony of the Owerri, St at Asumpta Cathedral Hall*, Owerri, on 19th November. The Vincentian Ibadan, National Publication of the Society of St. Vincent De Paul.

Enyi J. E. (2014), Rural and Community Development in Nigeria: An Assessment. *Arabian Journal of Business and Management Review (Nigerian Chapter), 2 (2), 17-21*

Gabriel, T. (1991). *The Human Factor in Rural Development London in Self- Reliance, Concepts, Practice and Rationale*, Galing J. (ed.), London: Beihaven Press.

Hussain, A., Tribe, K. (1981). *Marxism and the Agrarian Question*: German Social

Meier and Frank A. G. (1967). *Crisis in the Third World*. New York: Holmes Publishing House.

Matunhu, J. (2011). Critique of modernization and dependency theories in Africa: Critical Assessment, African Journal of History and Culture, 3(5), 65-72, retrieved from: http://www.academicjournals.org/ajhci.

NBS (2017). Unemployment rate in Nigeria, Premium Times. Retrieved from: http://www.premiumtimesng.comlbusiness/business-news/233172-%E2%80%8Enigerias-unemployment-rate-worsens-rises.\

Ndulu, B. J. (2004). Human Capital Flight: Stratification, Globalization, and the Challenges to Tertiary Education in Africa. *JHEAIRESA, 2(1): 57—91.*

Nigeria Debt Profile (2017). Vanguard Newspaper 17th February, 2017 Retrieved from: http://www.vanguarduar.comj2oI7/02/nigerias-total-debt-profile-57-39bn-dmo-boss. on 2th August, 2017

Nyerere, J. (1973). *Freedom and Development*. Nairobi: University of Tanzania.

Okoli, F. C. (2003). *Administrative Theories and National Development; A Discourse on Relevance and Comments on the Nigeria Society.* Nsukka: Topmost Press and Consultancy Services.

Preiswek, R. (eds). Self-Reliance: a strategy for Development Studies, Geneva.

Rodney, W. (1972). *How Europe Underdeveloped Africa*. Dares Salaam: Tanzanian.

Rodney, W. (1972). *How Europe underdeveloped Africa.* Darres Salam: Ethiope Press.

Salimu (1998). A History of Capitalist Development. Retrieved from www.socialismtoday.org.

Samir, A, Chitala, D, Mandaza 1(1987). SADCC Prospectus for Disengagement and Development in Southern Africa: *Studies in African Political Economy-United Nations University.* London: ZED Books Ltd.

Seers, D. (1969). Meaning of Development. *A paper presented at the 11th World Conference of the Society for International Development*. New Delhi: India.

Sunkel, 0 (1969). National Development Policy and External Dependence in Latin America. *The Journal of Development Studies, Vol. 6, no.1, p. 23.*

Todaro, M. P. (1977). *Economics for a Developing World.* London: Longman Group Limited.

Uwazie I. U., Igwemma A. A. and Ukah F. I. (2015). Contributions of Andre Gunder Frank to the Theory of Development and Underdevelopment: Implications on Nigeria's Development Situation. Journal of Economics and Sustainable Development,16, 32- 34. Retrieved from: http://c:/usersfhomeidownloadsfec0nomlc%2odependency%2oresearch.pdf.

FEMINISM, SOCIAL CHANGE AND THE FEMALE VOICES IN CONTEMPORARY NIGERIAN FICTION:
A TEXTUAL STUDY OF IFEOMA OKOYE'S
BEHIND THE CLOUDS

PRESENTED BY:

OGA, UWAIFO
DEPARTMENT OF LANGUAGES,
SCHOOL OF GENERAL STUDIES,
AUCHI POLYTECHNIC,
AUCHI.
Phone: 08034102396
e-mail: oga.uwaifo@gmail.com

AND

BRAIMAH, MUSA

DEPARTMENT OF LANGUAGES,

SCHOOL OF GENERAL STUDIES,
AUCHI POLYTECHNIC,

AUCHI.

Phone: 08056151548

Abstract

Women, generally, are regarded as the weaker sex, a group that cannot be independent of the males, a group that is usually painted negatively in male-authored literary pieces and in fact, a group that must be seen but not heard and which is subject to the social whims and caprices of obnoxious patriarchal customs and traditions. This is rather appalling and because of it, female writers have taken it as a duty to redress and socially portray positively the battered image of the womenfolk. In doing this, they present the female group as a make up of people who can and are decent, virtuous, pious, hard-working, independent, capable and responsible. As such, it is our strong belief that to fully understand and appreciate this fact, an indepth study of Ifeoma Okoye's <u>Behind the Clouds</u> is worth it. This is what is being attempted here.

Introduction

Female dependency on the male is ageless, and consequent upon this phenomenon, the former has persistently struggled to achieve a reasonable degree of parity with her male counterpart. This struggle is borne out of the belief that she is oppressed and so is determined to end that oppression. It is upon this background that Ifeoma Okoye's *Behind the Clouds* is a novel worthy of detailed study.

Our scope in the study of Ifeoma Okoye's *Behind the Clouds* is woven around her dwelling on the consciousness of the Nigerian woman by making her aware of her second class status in Igbo patriarchal society as well as advocating a social change in attitude that gives rise to unnecessary sufferings in black women and sets out to correct the debased image of Nigerian women.

Before going into the main study, however, it is necessary to take a peep into feminism, as a term.

A critic, Kelly (1988:163), defines feminism thus "Feminism minimally speaking is a belief that women are oppressed and a commitment to end that oppression".

Feminism as a concept is rather protean and as such, it becomes difficult to arrive at a universally acceptable definition. It is in recognition of these variations in definition that Sheila (1980:4) observes:

> Feminists do not agree among themselves on one all-inclusive and universally acceptable definition of the term feminism. Depending on one's political, sociological observations and goals; one's individual aspirations for womanhood and for humanity; one's understanding or interpretation of the word woman; and several other factors, the term feminism can mean different things and have variety of functions.

In other words, Sheila (1980) observes here that the meaning feminism is multifarious so that the definition one gives to it will depend largely on the perspective from which one views it.

Some female writers look at feminism from a radical perspective and in that regard, advocate a thorough and complete equality with the male in all ramifications without a compromise, while some others are more liberal in their approach. The former category best describes some of Buchi Emecheta's novels while Ifeoma Okoye, Flora Nwapa and Zaynab Alkali fall into the latter.

Whichever way the term is viewed, however, it is not unconnected with the liberation of womanhood the group or gender which should be seen but never heard, from male chauvinism and social patriarchy.

The oppression of women is a universal phenomenon and because of this, the discourse is not devoid of a global dimension. De Beauvoir (1972:23) in this respect observes:

> The situation of women in the world is comparable to that of the American blacks. Both are being emancipated today from a like paternalism, and the former master class wishes to keep them in their place-that is second class citizen.

The above observation is not only applicable to women in Europe and America but also to Nigerian women. In fact, Buchi Emecheta, one of Nigerian's feminist writers, derives the title of her second novel-*Second Class Citizen* (1974) from De Beauvoir's phrase.

We want to state, at this point, that it is appalling to note that social thought is not only male-dominated but male-centred as well. The use of the word 'man', to represent humanity shows that the female is a derivation or subset of the male. This goes a long way to explain why more has been written about men than about women and why the little that has even been written about women displays open bias. Alexander (1989:47) points out in this respect:

> Even today, when bookshops are amply stocked with literature by women and about them and with specialized materials from feminist publishing houses, it is still the case that women's writing receives less critical attention than is given to men's writing.

Main Discussion

Coming to the core of this study, literary genres happen to be one of the most effective media through which Nigerian female writers have voiced out, albeit vehemently, the need for women everywhere to rise up to the challenge of achieving a reasonable degree of parity with their male counterparts. Their perspective consists of taking interest in the lifestyles, activities and occupation of women both at home and in the society at large. From the foregoing, one can deduce that women desire a situation where they are valued, recognized and counted equal with the men in the society. Left to them, womanism is about valued autonomy for women as individuals and for them as a group. In this regard, they mean to develop in themselves and in their environment, the condition that will enable them control their own political, social, economic and personal destines. To buttress this, Sheila (1980:4) once again declares:

> As feminists, we value and prize the fact of being woman as highly as we value the fact of being human. We do not accept the cultural images of women as incompetent, petty, irresponsible or weak. Rather, we affirm our capacities to be strong, capable, intelligent, successful. ethical human beings.

Womanhood and the Nigerian Society: Ifeoma Okoye's *Behind The Clouds*

Women in Africa and Nigeria in particular have always been presented as scapegoats in the family. Whatever problem that befalls the family is attributed to the woman. Ifeoma Okoye in the novel, *Behind the Clouds*, deals with the theme of childlessness in a typical Nigerian family as it affects the females. The novel chronicles the struggles for honour and respect by the protagonist, Ije Apia, a not-totally infertile woman. Ifeoma Okoye , unlike Bushi Emechata, does not advocate for a total separation between the man and the woman. She, in an attempt to promote social change - a more humane rapport in marital relationships between childless couples, presents a unique perspective of the problem of childlessness.

The novel reveals a plot conceived in irony and which ends in irony. Ije, the good-natured wife of the loving, hard-working and successful architect, Dozie, is presumed barren and a great deal of anxiety and money are expended on her "cure" whereas it is Dozie who is sterile all along. At last, after Dozie "proves" his manhood by supposedly making the rude Virginia, a woman of easy virtue, pregnant, it dawns on Dozie through Virginia's tactless taunts that he cannot impregnate any woman. Dozie consequently goes for a test overseas and regretfully admits to Ije, his wife thus " I am sorry that you've subjected yourself to all kinds of treatments, unpleasant ones and dangerous ones, when I have all along been the cause of our childlessness".

As part of Ifeoma Okoye's aims in this novel to correct the ugly and erroneous portrayal of women in Nigeria in particular, she presents a couple's marital problems in the right perspective. In addition, she sets out to rehabilitate and revaluate female characters from the usual male chauvinist point of view of male writers, to what she considers a fair and objective criticism.

This observation represents the patriarchal setting and attitudes of the Nigerian society which is reflected in the literary works predominantly replete with male writers. Male writers deal almost exclusively with male characters and male concerns that are naturally aimed at an entirely male audience. All these ill-treatments meted out to womanhood are what Ifeoma Okoye sets out to rectify in her novel.

The first page of the novel reveals Ije, the protagonist, in the hospital waiting to be attended to by the supposedly "saviour" doctor, Melie. Ije has been told that he will perform the "magic" which will eventually make her become pregnant and have her own children. The burden of childlessness rocking her family lies almost exclusively on her and she wonders in thought over so many tests she has subjected herself to in her quest for children. The narrator comments thus:

> Ije sat there, her mind plunged deep into the past: a past full of failures that still rankled. She remembered vividly all the doctors who had treated her- the tests, the minor operations, and the major one that had almost killed her. She remembered also the herbalists she had approached for help. (1-2)

It is interesting to note, however, that in all the tests Ije has been receiving (to no avail), the husband was never tested. Ifeoma Okoye is, therefore, suggesting to her reading audience that it is not right to blame all the cases of infertility and childlessness on women alone, drown her with drugs and subject her to all kinds of psychological tortures without also testing the man towards ascertaining his potency. She makes the readers to understand that the patriarchy which puts the blames solely on the shoulders of the woman betrays ignorance and, in some cases, sheer saddism.

In the light of the above, Ifeoma Okoye shows, for instance, how Ije's husband misjudges in viewing their fruitless marriage as a "female concern" and as such, Ije alone is encouraged to seek medical help. Ifeoma Okoye bares her mind in the words of Beatrice thus "I don't know why in this country of ours it is always the women who take all the blame when a couple is childless".

Women, the author points out, are indeed scapegoats of tradition. This is in the sense that the failure of most marriages in the society is always blamed on them. The truth of this reality is evident in the novel as Ije becomes the victim who is condemned for their sterile marriage.

Furthermore, Ifeoma Okoye also draws attention of the readers to the partial, one-sided medical investigations of the medical doctors who are highly patriarchal and biased against women when it comes to the treatment of family problems. The "famous" doctor, Melie, fails to ask Ije to bring along her husband for tests after he found nothing wrong with Ije but proceeds to "treat" her in spite of all indications of the healthy state of her reproductive system. The narrator observes:

> She stopped by the corner of the building to read the reports
> before taking them to her doctor. She knew it was wrong to read
> the reports… The reports indicated that her fallopian tubes and
> uterus were normal.

Again, Ije's mother-in-law accuses her that "---- her childlessness was a punishment for her unchaste life as a spinster".

In all these, Ije makes no comment and, at last, when her mother-in-law has nothing more to say, she bursts into tears. Not offended, Ije moves over to her and begins to console her even though she too is on the verge of crying. She consoles thus:

> "Mama," she said putting her hand on her mother-in-law's lap, 'a
> child comes from God. I still believe that one day God will give
> you many grand-children through me. I had a pure life as a girl.
> Only God is my witness.

To neither her mother-in-law who obviously sees no good in her nor to Virginia who intrudes into her family with clear crudity and extreme bad manners, does she give a piece of her mind. In short, she is shown to be nothing less than a saint. She surrenders her salary to her husband whom she educated by holding down two jobs in England and in the long run, when Dozie asks for forgiveness, she readily accepts him back without any pre-condition. Ifeoma Okoye, from this, uses Ije to prove to the society that women are cultured, well-behaved, ethical and understanding set of human beings as opposed to the bias and prejudices against them by most male authors.

Conclusion

Abati (1996:8) commented on the extent to which women have been reduced. He opines:

> Within the last decade, development scholars across the continent
> have had to tackle the problem of women. Based on concerted
> research, the conclusion has long been reached that women are a
> decentred, denatured subspecies of humanity, harassed by culture,
> intimidated by polities and subsumed under patrilineal and patriarchal
> structure which pampers male ego.

Despite this, however, we have seen various examples of women like Ije in this study, who have asserted themselves and left behind them monuments of power, glory and deep respect.

In fact, we make bold to state that the message Ifeoma Okoye presents through Ije in *Behind the Clouds* is very clear. She aims at cementing matrimonial ties by presenting the couple's reconciliatory gestures towards the end of the novel. Some feminist plots end with the separation of the man and the woman but her work is committed to the revival and unity of males and females, and the home. Herein lies the significance of the novel. She has set out in a rather pragmatic way, to bring about the utter destruction of retrogressive Igbo cultural norms in particular and that of the entire Nigerian society in general, which often esteem the male to the detriment of the female. In addition, she has successfully disabused the minds of her readers that marital problems which have to do with childlessness should not only be attributed to women but be seen as a shared affair. This way, the author has succeeded in achieving the redemption of the humiliated image of womanhood in Nigeria in particular and Africa, in general and also elicited in the minds of the readers, the need for social change and re-orientation as it relates to such family problems.

References

Abati, R. (1996). “Women in Transition”. *The Guardian*. February, 16.(8).

Alexander, F. (1989). *Contemporary Women Novelists*. London: Edward Arnold.

De Beauvoir, S. (1972). *The Second Sex*. Trans. By H.M. Parshely. Harmondsworth:. Penguim Books.

Emecheta, B. (1974). *Second Class Citizen*. London: Allision and Bosby.

Kelly, L. (1988). *Surviving Sexual Violence*. United Kingdom: Polity Press.

Okoye, I. (1982). *Behind the Clouds*. London: Longman.

Sheila, R. (1980). *Issues in Feminism*. Boston: Houghton Mifflin Company.

Impact of Fermentation on the Proximate composition and Organoleptic Quality of Maize flour in cake production

[1]U.J., Ovueni, and [2]A.O., Jeje
ovuenijoe@yahoo.com
[1&,2] Department of Basic Sciences, School of General Studies, Auchi Polytechnic, Auchi.

Abstract

The impact of fermentation on the proximate composition of maize flour and Organoleptic Quality of maize cake was investigated. Maize (Zea mays) flour was processed into unfermented flour (UFMF) by drying sorted and washed maize grains (500g), after which they were milled into flour using a disc-attrition mill and sieved using a 250µm sieve to obtain uniform particle size. Fermented maize flour (FMF) was prepared by drying, milling and sieving 500g of maize grains fermented for 72 hr using Saccharomycese cerevisiae. Proximate analysis was carried out on both flours (FMF and UFMF). Sensory evaluation of cake produced from both flours and various compositions with wheat flour was also carried by a 10-man panel using a 9-point hedonic scale. Statistical analysis on the sensory scores was performed to ascertain if there was significant difference in Organoleptic Quality. The result of the proximate analysis indicated a 35.8% increase in crude protein in FMF. The percentage lipid also increased by about 75% in FMF. The carbohydrate content was lower in FMF; 79.68 than UFMF; 82.22. Statistical analysis of the results of the sensory evaluation of the cake products showed no significant difference in the Organoleptic Quality of cake produced from wheat flour and fermented and unfermented maize flours. Highest overall acceptability was recorded for cake produced from wheat flour; 8.6, followed by that made from fermented maize flower FMF 7.7.
Key words: Fermentation, Proximate composition, Organoleptic Quality.

Introduction

Maize flour is produced from dried maize grains after harvest. It serves as an effective processing against storage loss. Locally the curbs are sundried, or dried over heat. The dried grains are grounded into flour using a wooden mortar and pestle and repeatedly sieved to produce a uniform texture or the use of motor driven milling machine. The resulting product is a white to cream flour, which can be stored for months. The storage environment must be dry to prevent the growth of moulds and must be well protected from weevils, which may infest the dried products (Uchechukwu-Agua, 2015).

Fermentation is an essential technology that is required for converting lignocellulosic materials in food produce such as yam, cassava, rice, maize and so into value-added products which have potential to used for animal nutrition to solve the problem of inadequate intake of protein and calories. This will also reduce waste, pollution as well increase quality of animal products. According to Anupama and Ravindra (2000) fermented products contain proteins that can feed both humans and animals thereby replacing expensive conventional sources of protein like fishmeal and soymeal. However it is important to use microorganism that are "Generally Regarded as Safe for fermentation in order to promote its use. *Saccharomyces cerevisiae* is widely accepted due to long history of its use in traditional fermentation and its nutritional quality.

The principal problem in agricultural products in Nigeria is the high post harvest losses. Another constraint to maize production is the limited processing technology. About 30% of harvested maize grains are lost to waste. The bulkiness of fresh transport and low margins for both famers and traders are thus a matter of serious concern in the urban market. During the processing of maize through sun-drying method the problem encountered is the losses due to potential contamination of the product variability in drying time, rain damage and so on. Health challenges owing to gluten content of wheat flour as well as high cost of wheat flour are factors driving research efforts at finding an alternative to wheat flour. This work, therefore investigates optimum conditions for processing maize into other valued products in order to increase its shelf-life.

Materials and Method

Collection Of Samples

White maize (*Zea maize)* used for this study was purchased from a local market in Auchi, Etsako West Local Government Area of Edo State, Nigeria. They were identified in the Department of Agricultural Technology, Auchi Polytechnic, Auchi. Wheat flour used as control was also purchased from a local market in the same Local Government Area.

Processing of Maize Flour

The maize grains were washed with tap water and rinsed with distilled water. One part (500 g), was sundried for 48 hr. The dried maize grains were milled into flour using a disc-attrition mill. The resulting flour was then sieved (using a 250 µm sieve) to obtain uniform particle size. The unfermented maize flour, *UFMF,* was then packed in a clean plastic bucket with a lid (labeled UFMF), and kept for subsequent use (Eriksson, Koch, Tortoe, Akonor, and Oduro-Yeboah, 2014).

The other part of the maze grains were placed in a 20 L plastic bucket with lid. Boiling water was added to it to solubilize the starch granules (Eriksson, *et al.*, 2014). It was allowed to stand until the temperature of the slurry became 45^{o}C. Yeast cells (*Saccharomycese cerevisiae)* were then added, 0.3 g/L of fermentation substrate and the slurry was stirred to allow proper spread of the yeast (Azoulay, Jouanneau, Bertrand, Raphael, Janssens and Lebeault, 1980). The set up was then allowed to ferment for 48hrs. The fermented mash was then drained of water and sundried for 48 hrs. The dried mash was milled into flour using a disc-attrition mill. The resulting flour was the sieved (using a 250µm sieve) to obtain uniform particle size. The fermented maize flour, *FMF,* was then packed in a plastic bucket with a lid (labeled FMF), and kept for subsequent use (Eriksson, *et al*, 2014).

Proximate Analysis
Standard analytical procedures for food analysis were adopted in carrying out the determination of moisture content, ash content, crude protein, crude fibre and crude fats and while available carbohydrate was calculated by difference. The proximate composition was determined using the method of AOAC (1990).

Cake Making

The cake batter was prepared using 100 g flour, 50 g sugar, 20 g liquid milk, 9 g egg (1 large egg), 25 g soy oil, 5 g baking powder, 3 g salt (Ozkahraman, Sumnu, and Sahin 2015). Wheat cake containing no maize flour was used as control (WF). 100 % Unfermented maize flour (UFMF), and Fermented maize flour (FMF) were used for another treatment. The other samples consisted of different composite mix of these three basic flour; WF:FMF_1 (70:30), WF:$UFMF_1$ (70:30), WF:FMF_2 (50:50), and WF:$UFMF_2$ (50:50). The ingredients were mixed for about 5 min manually and thoroughly. Prepared cake batter samples (100 g each) were poured into metal cake cups with 8.7 cm diameter and 4.8 cm in height. These were then transferred to an electric oven, model MC-2121, preheated to 175 °C. The cake samples were baked for 25 min at 175 °C (Ozkahraman, *et al.,* 2015).

Sensory Evaluation of Cake
The cakes were allowed to cool and cut into slices of uniform thickness and transferred onto clean plates coded with random single-digit codes. A sensory panel consisting of 10 semi-trained graduate students of Hospitality Management Department, Auchi Polytechnic, familiar with sensory attributes of local cake was employed to evaluate the products. A 9-point Hedonic scale was used to rate the cakes for aroma, texture, appearance, taste, and overall acceptability. A score of 1 represented "dislike extremely" and a score of 9 represented "like extremely" (Erikson *et al.*, 2014). A cake sample was evaluated at a time with water and neutral cream crackers given to each panelist to refresh palate.
Statistical Analysis
Kruskal Wallis non-parametric analysis of variance was performed to calculate mean Ranks and significant levels for aroma, texture, appearance, taste and overall acceptability. Student't' test was performed to compare the mean values of the proximate composition of the fermented and unfermented yam flours. Significances were determined at P<0.05.
Results and Discussion
Table 1 shows the results representing the proximate composition of the fermented and unfermented maize flour. The percentage moisture content of both flour samples did not show much difference; 8.90 for UFMF and 9.10 for FMF. The percentage ash content, however, was higher for UFMF, 1.24 than FMF, 0.74.

Table 1: *Proximate composition of the unfermented and fermented maize flour*

Flour	M(%)	Ash(%)	CP(%)	CL(%)	CF(%)	C(%)
UFMF	8.90	1.24	6.34	0.80	0.50	82.22
FMF	9.10	0.74	8.61	1.40	0.47	79.68

*M- *moisture*, CP- *crude protein*, CL- *crude lipid*, CF- *crude fibre*, C- *carbohydrate*

The crude protein of FMF increased by about 35.8% over that of UFMF. The was no difference in the percentage crude fibre of UFMF and FMF (0.50 and 0.47). The percentage lipid increased by about 75%. The carbohydrate content showed a slight decrease in percentage for the fermented flour, 79.68 as against 82.22 for UFMF.
The mean scores for the sensory evaluation of cake produced from wheat flour, unfermented maize flour (UFMF), fermented maize flour (FMF) and composite mix of WF, UFMF and FMF are presented in table 2.

Table 2: Mean Scores for sensory evaluation of the cake samples

Cake Sample	Aroma	Texture	Appearance	Taste	General Acceptability
WF	8.6	8.4	8.7	8.5	8.6
UFMF	7.4	6.4	5.6	5.4	6.4
FMF	6.5	7.4	7.6	5.6	7.7
WF: $UFMF_1$	7.2	8.2	8.4	7.4	7.3
WF: $UFMF_2$	6.8	7.2	7.4	6.8	6.2
WF:FMF_1	7.2	7.6	8.4	6.6	7.5
WF:FYF_2	6.8	7.8	7.4	5.7	6.4

*WF-*wheat flour,* *WF:$UFMF_1$-*composite flour 70:30,* *WF:$UFMF_2$, 50:50, *UFMF, 0:100*
*WF:FMF_1-*composite flour 70:30,* *WF:FMF_2, 50:50, *FMF_4, 0:100*
**FMF-fermented maize flour, *UFMF-unfermented maize flour*

Scores for Aroma ranged from 6.5 - 8.6, with wheat flour (WF) having the highest mean score of 8.6, followed by 7.4 for unfermented maize flour (UFMF). Fermented maize flour had the least score for aroma of 6.5, followed by WF:$UFMF_2$ and WF:FMF_2. The mean scores for texture ranged from 6.4 to 8.4. Wheat flour had the highest mean score of 8.4 followed by WF:$UFMF_1$, 8.2, with WF:FMF_2, and WF:FMF_1 having 7.8 and 7.6 respectively. Wheat flour also had the highest scores for appearance, taste and general acceptability; 8.7, 8.5 and 8.6 respectively. UFMF had 5.6, 5.4 and 6.4 respectively. While FMF, had 7.6, 5.6 and 7.7 respectively. The least score for general acceptability was recorded for WF:$UFMF_2$; 6.2, while the highest score was recorded for wheat flour; 8.6, followed by FMF; 7.7.

Generally, the fermentation process had significant impact of the protein and lipid content of maize flour. The lipid content recorded about 75 % increase; this can be attributed to microbial growth during the fermentation process. It has been reported that organisms can produce microbial fat during fermentation (Joko and Kazuhiko, 2013). This argument is also applicable to for the enhancement of the protein content, which recorded about 35.8% increase due to fermentation. Microbial strains have been reported to secrete extracellular proteins into yam starch granules during fermentation, forming single cell protein (Oboh and Elusinya, 2007). Osman (2011) also reported increase in protein content through fermentation process of millet during traditional preparation of Lohoh. The decrease in carbohydrate is consistent with the fact that the carbohydrate formed a carbon source for the fermenting organisms.

Statistical analysis of the results of the sensory evaluation of the cake products show no significant difference in the Organoleptic Quality of cake produced from wheat flour and fermented and unfermented maize flour. Highest overall acceptability was recorded for cake produced from wheat flour (8.6), followed by that made from fermented maize flower FMF (7.7). Statistical analysis indicate that cake made from fermented maize flour and unfermented maize flour compared favorably with that made from wheat flour. The result is similar to that obtained by Edema, Sanni, and Sanni (2005) who reported that bread baked with 10 and 20% yam – wheat composite flour were not significantly different in any sensory attributes. The result varied slightly from that of Lemchi, Mbah, and Obi-Anyanwu, (2016) who reported that 50:50 combination of wheat flour and maize flour cake were unacceptable, however, the taste and overall appearance of maize flour and yam flour were also acceptable except in the 50:50 composite combination of wheat and maize flour cake.

CONCLUSION

This research is aimed at evaluating the impact of fermentation of maize on the nutrient content of maize flour and organoleptic quality of maize cake. Specifically the study determined how fermentation using *Saccharomycese cerevisiae* impacted on the nutrient and sensory attributes of maize flour. This work was able to establish that: fermentation enhanced the nutrient content of maize flour; and that Maize flour presents a good combination with wheat for baked products. Thus, this study has added to scientific facts showing that maize can be fermented and processed into flour to enhance its nutritional value as well as reduce post harvest losses and that maize flour can be used in combination with wheat for baking purposes.

References

Anupama L and Ravindra, P. (2000). Value-added food: single cell protein. *Biotechnol Adv* 18(6): 459-79

Azoulay E, Jouanneau F, Bertrand J, Raphael A, Janssens J and Lebeault J M (1980) Fermentation methods for protein enrichment of yam and corn with *Candida tropicalis*. *Applied and Environmental Microbiology* Vol.39 no. 1, p. 41-47.

Edema, M.O.,Sanni,L.O.,Sanni,A.I.,(2005). Evaluation of maize-soy-bean flour blends for sour dough maize bread production in Nigeria. *Afr. J. Biotechnol.* 4(9),911–918.

Eriksson E, Koch K, Tortoe C, Akonor P T, and Oduro-Yeboah C (2014) Evaluation of the physical and sensory characteristics of bread produced from three varieties of yam and wheat composite flours. *Food and Public Health* 4(5): 214-222

FAO. (2011). *Food and Agriculture Organization of the United Nations statistics* database retrieved 2 November, 2017 from: www.faostat.fao.org.

Gbadegesin MA, Olaiya CO, Beeching JR (2013). African cassava: *Biotechnology and molecular breeding to the rescue*. http://dx.doi.org/10.9734/BBJ/2013/3449

Joko, S. and Kazuhiko, L. (2013). Cassava flour modification by microorganisms. *ResearchGate* DOI:10.13140/2.1.3702.4966. https//www.researchgate.net

Lemchi, S.N; Mbah, C. A. & Obi-Anyanwu, J.N.(2016). Sensory Evaluation of Use of Maize and Yam Flour in Composition With Wheat Flour for the Production of Selected Snacks *International Journal of Advanced Academic Research* | Education | ISSN: 2488-9849 Vol. 2, Issue 2

Madubuike P C, Onyema C T, Odinma S C and Sokwaibe C E (2014) Evaluation of mineral elements, cyanide and proximate composition of yam (*Mannot esculenta crantz*) from Ebonyi State, Nigeria. *Journal of Environmental Science, Toxicology and Food technology,* Vol. 8 ver. 11, pp41-43.

Oboh, G. and Elusiyan, C.A (2007). Changes in the nutrient and anti-nutrient of micro-fungi fermented cassava flour produced from low and medium-cyanide variety of cassava tubers. *African Journal of Biotechnology* Vol 6(18) pp 2150-2157

Osman, M.A (2011). Effect of traditional fermentation process on the nutritional and anti-nutritional content of pearl millet during preparation of Lohoh. Science Direct. Online Journal. http//www.sciencedirect.net.

Ozkahraman, B C Sumnu, G and Sahin S (2015) Effect of different flours on quality of legume cakes to be baked in microwave-infrared combination oven and conventional oven. *Journal of Food Science Technol* 53(3): 1567 – 1575

Uchechukwu-Agua, A.D (2015). Effect of storage conditions and duration on physiochemical and microbial quality of the flour of two cassava cultivars. *Journal of Food:* Vol 13, No.4: 23-28

INFORMATION AND COMMUNICATION TECHNOLOGY: A VERITABLE TOOL FOR CATALYZING FUNCTIONAL EDUCATION IN NIGERIAN TERTIARY INSTITUTIONS

BY

BRAIMOH MIKELOVBA EZEKIEL,

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES,

SCHOOL OF GENERAL STUDIES, AUCHI POLYTECHNIC,

AUCHI-EDO STATE.

Email:Zeekbraim@gmail.com

Phone number: 07064722226

AND

ALI AMINU,

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES,

SCHOOL OF GENERAL STUDIES, AUCHI POLYTECHNIC,

AUCHI-EDO STATE.

Email: aliaminu 9735@yahoo.com

Phone number: 08071262868

Abstract

Information and communication technology has indisputably become one of the critical drivers in the world over and the education sector no doubt enjoys ICT as a veritable tool of transformation and development. However, education in most developing countries is but a reflection of the surrounding under-development. No doubts that there are obvious deficiencies, consequent upon which the need to arouse academic scholarship, to continuously engage research discourse in this direction. It is against this backdrop that this work which largely centres on ICT as a transformational tool for functional education, discusses the concept of functional education, ICT challenges and solutions. The work also looks at a theoretical model of ICT as a catalyst for functional education and concludes with the recommendations that particular efforts be made to give recognition to graduates evolving from e-learning programmes. Budgetary allocation should be favourably disposed to stepping up ICT facilities and correspondence courses for lecturers and students, among other suggestions.

Keywords: ICT, catalizing, functional education, transformation.

Introduction

Nigeria has identified information and communication technology as a key facilitator of economic and overall growth and development. According to Credes & Mansell (1998), Information and Communication Technology is critically important for sustainable development in countries and this makes a case for the widespread research interest in ICT.

Although, Nigeria has continued to demonstrate an irrevocable commitment to education as a tool for national and personal development, it had and still has vacuums it must endeavour to cover from the socio-economic to the structural dimensions of providing education for its swelling population.

The National Open University, for example, was established by an Act of the Nigeria parliament in 1983 but was abrogated unlawfully in 1984 by the military government of Gen. Buhari that then toppled power. However, after many years of its closure, the compelling reasons that informed the earlier establishment of the University were still confronting the country prominent of which were the need to take advantage of emerging developments in the fields of information and communication technologies which have had a revolutionary impact on the techniques and methods of instructional deliveries in distance learning mode and the need also, to fill the vacuum created by the conventional universities and polytechnics. Thus, in 2002, the National Open University Act of 1983 which was suspended in 1974, was resuscitated.

This rebirth of the National Open University of Nigeria (NOUN) has renewed the desire to make education available to as many as have the ability and willingness to benefit from a quality education process provided via flexible and affordable distance learning applications.

Functional Education

Omohan (2O04) defined functional education as the process of the training of the individual in the society, through which one acquires the methods and skills that will enable him adapt and be able to control and manipulate, at least, to some degree, the forces of nature or the environmental condition in which he lives. He further argued that "Education is the process of relating the individual to society, so as to secure the development of personality and social welfare."

Odia (2004) opined that the approaches and attitudes to education in our society belong to recognizable patterns and categories in the history of education. According to him, since ancient philosophers like Plato, through Rousseau and Dewey and our own Chief Obafemi Awolowo, philosophers of education have had about five basic ways of looking at education, all of them mutually interlocking, which have informed the various studies and designs of education systems; these five ways are:—

- education for civility and culture
- education for public individual empowerment
- education for public enlightenment and democracy.
- education for manpower and economic development
- education for national power.

For education or any system of education to impact positively, therefore, it must be seen to meet one or two or all of these criteria that have been given above.

The Role Of ICT As a Paradigm Shift In Education

Thioune (2003) notes that in the past two decades, most developed countries have witnessed significant changes that can be traced to ICTs. Theses multi-dimensional changes are observed in almost all aspects of life: economics, education, communication, securities and travel.

ICTs have made it possible to quickly find and distribute information and have all the more created numerous learning media in education so that a greater number of those who would not have been able to work and develop self are able to do so more easi1y and quite affordably.

Flexible Skills Development

The breakthrough in ICTs has engendered the development of flexible skills development which, as coined by Commonwealth of Learning, is to increase access to education and skills, especially for the disadvantaged groups in or society.

ICTs have obviously and drastically broken the status quo in the educational structures and systems of states and this has created an alternative academic programme such as the National Open University, e-1earning systems, e-libraries, etc.

The flexibility engendered by ICT enables distance learners to determine what they wish to learn, how and where and when to learn it. This ease with which to learn and work almost simultaneously; will help in no small way in coping with the unchecked population growth of Nigeria.

The face-to-face (f2f) educational system of Nigeria has been altered by the recent emphasis and reality of distance learning as enabled by ICT digitals. In the educational sector, especially in Nigeria, the face-to-face approach was in vogue until this ICT age in which teaching and learning can be done without the physical appearance of the one (teacher) and the learner. However, despite the existence of ICT's and their flexible formats, the fact still remains that learning via ICT facilities cannot be functionally exclusive but inclusive to the extent that it will require some human/physical presence (face-to-face approach) to effectively blend and make impart.

Impact Of Ict On The Nigerian Educational System

The centrality of ICTs to the overall educational development of any country cannot be adequately captured in a few line of words; as such, effort to discuss its vitality to educational growth will no doubt, always refer us to discussing the impact of' ICTs on the economy of a country. The significance of ICTs to national growth can hardly be extricated from educational development hence the nexus of ICT, educational and National development.

Ict And The Reality Of Engineering Educational Development

The development of the Nigerian educational system even in the face of robust inventions and ICT applications can yet remain hindered owing to a number of factors such as:

1) If and when no proactive step is taken to encourage, advance and domesticate academic programmes tailored by/with computer literacy, the desired transformation may well be further than we can see.
2) If no financial commitment is made towards ICTs and its applications, no matter its significance, it cannot bring to bear on the educational sector the anticipated changes.
3) Application of ICTs if not made a matter of effective practice may never translate into any meaningful revolution in Nigeria's educational advancement.
4) The availability of electricity is a precondition for effective functioning and durability of the gains of ICTs without which any ICT facility will he as docile as a transformer disconnected from our national power grid.

Ict As An Intermediary Between Conventional And Distance- Learning

ICTs in the advancement of learning can be very useful to the Nigerian National Open University; but it is also very relevant in regular/conventional educational system as well.

No good research may easily and accurately be carried out without a reasonable communion with the internet. This goes to say that for an academic or a researcher to stay on top, he must imbibe ICT skills. Credes and Mansell (1998) cannot make feat by relying on books and libraries alone. Suffice to say that most intellectually challenging and stimulating academic works can and in most cases are only available on the internet.

Much as the distance learners need ICT facilities they also need a blend of on-line/ICTs and a face-face approach in teaching and learning ICTs are needed in regular education to bring about an appreciable level of transformation.

Significance Of Ict In Catalyzing Functional Education

ICT refers to technology enabled communication via electronic capture, processing and transmission of information. Oliveira (1989) argues that ICT is a formidable tool for developing countries to leap up to the economic level of developed nations.

ICT-enhanced education is perceived as a way to relieve poverty, social divisions and improve living standards due to the fact that ICT can deliver educational services at a lower cost.

The Digital Divide

The use of ICT in developing countries when compared with developed nations, is relatively limited because according to Gulati & Kozma (2008,1999), underdeveloped nations face shortages of financial resources, limited internet access, lack of trained teachers and lack of supportive policies.

Digital divide refers to the huge gap that exists between the developing World and the developed World in the usage of ICT (Parliamentary office of Science & Technology, 2006). There is an abundance of ICT life surrounding education in developed countries and as such they are more able to take optimal advantage.

According to Kozma (1999), ICT infrastructure in developing or underdeveloped countries is weak and internet access is limited, supply of PCs in schools is much less than needed and trained persons who can resolve computer literacy are also a serious challenges.

Challenges

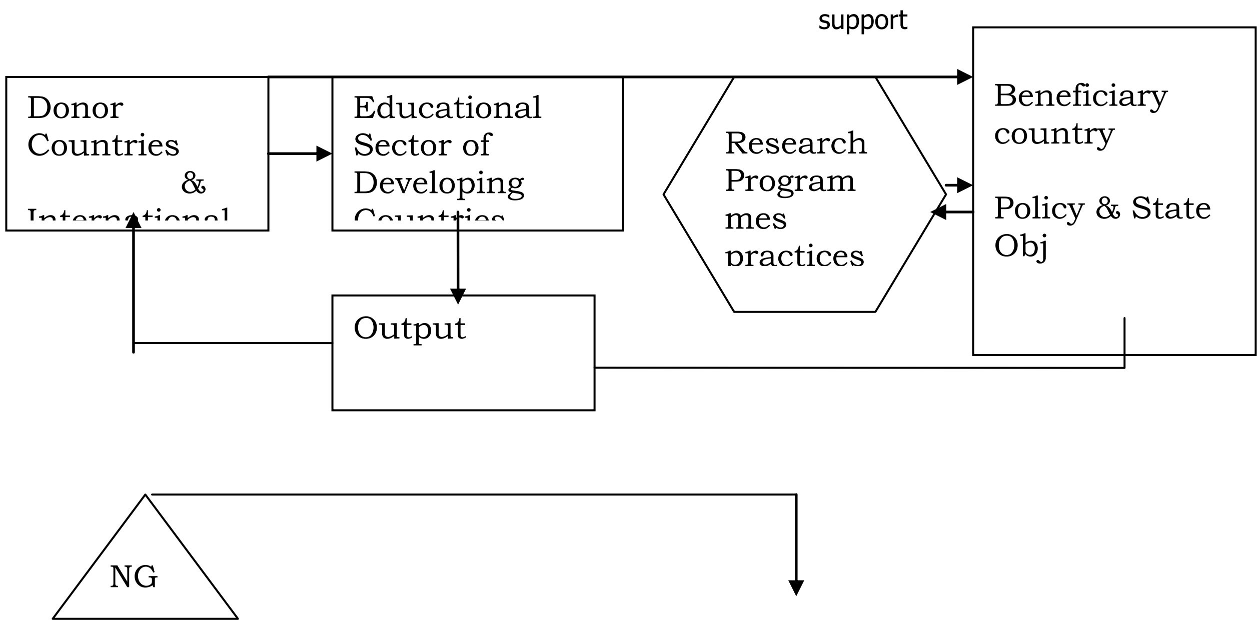
There is an overwhelming agreement amongst scholars that ICT is a reliable tool for improving the quality of life and that this quality, when achieved, can shrink the gap obvious between developed and underdeveloped nations of the World. In this consideration, the adoption of ICT as a critical strategy to reenact and reinvent the Nigerian educational sector is more than necessary.

The challenges that have often worked against the moves to revamp the effectiveness and efficiency of the Nigerian educational sector using ICT are but not limited to the following:

- Financial problems.
- Limited access to internet.
- Curricular planning problem.
- Lack of trained staff.
- Lack of enabling policies.

Financial Problems: The problem of financing Nigeria tertiary education has been a protracted one. Often times and even recently the Academic Staff Union of Universities (ASUU) embarked on a nation-wide strike which dragged on for more than six (6) months, a situation capable of collapsing the sector. The strike option appears to be the most potent tool for reminding the federal government of Nigeria to attend to the routine needs of staff salaries owed in arrears, infrastructural needs, training and a host of other request needed for functional performance of the educational system. Conclusions are therefore not scarce in affirming that financial limitation is a basic problem confronting the Nigerian educational system especially in its efforts evolve make ICT-driven educational and training.

Although efforts have been and are still on-going by organizations such as the United Nations and foreign countries to deal with the financial burden of countries, but this is not without its encumbrances as such donor countries or aid-providers seek to directly or indirectly influence the research focus and policy input and output options in scholarship which also translates to imperialism of a sort. A recent example is the threat of aids withdrawal by Britain and America on the Anti-gay bill Nigeria and Uganda recently signed into law.



The relationship created and sustained, using the above illustration continues to encourage the imperialistic tendencies of developed states on developing states and, by extension, sustains a system in which both the citizens and ideology of developing states end up as appendage of Western designs and experiment which altogether further our status as either underdeveloped or developing state.

The problem of financing education probably accounts for Africa's failure to found and fund a reliable University that can effectively compete with the World's most renowned universities like Oxford and Harvard.

Limited Access to Internet: Access to internet has been identified in the adoption of ICT to spur the educational sector into better performances, especially as both lecturers and students are compelled to pay so much in subscribing for data plans. According to Gulati (2008), poor infrastructure in developing nations such as supply of electricity, low infrastructure has a negative effect of reducing the efficiency of an ICT option for school systems.

Curricula Problems: Curricular management has also affected the Nigerian educational sector and students who are computer illiterates.

The Nigerian post primary education has not recorded any reasonable performance in the teaching and learning of computer especially in the public schools which a higher number of the poor and less-privileged children. Although these post primary curriculums in Nigeria have Computer Science as a subject often time, it is a compendium of computer history with little or no skill in computer operation and application. This unfortunate situation has largely resulted to the regrettable outcome of having a backlog of graduates yet to be properly learned in computer programming operation and application.

This perceived level of computer illiteracy, engendered by outdated curricula has also constituted a problem area for the Nigerian educational system. Consequently Nigerian tertiary institutions are not exempted from this deficiency.

Efforts need to be made to step up the use and application of ICT facilities in tertiary institutions in a bid to build an appreciable knowledge base and application. Failure to adopt an ICT-friendly education approach in research fields will make it an uphill task for scholars in Nigeria to collaborate and partner with foreign counterparts with a view to engaging contemporary academic issues, and until Nigerian scholars are able to interface and interconnect with scholars outside the Nigerian academic milieu, the system will yet remain a dwindling circus of engagement and reengineering of obsolete ideas or approaches which scholars in developed climes may have outlived.

Lack of Trained Staff: According to Gulati (2008) Kozma (1999), when it comes to practically applying ICTs which is new to traditional teachers, many may not know how to deal with and sometimes are reluctant to accept new technologies in their classrooms.

However, the point needs to be made that Gulati & Kozma's (2008, I 999) submission in this regard is no longer tenable as many tertiary institutions in Nigeria have made reasonable efforts at training staff via seminars and workshops. The invention of new cell phones with improved versions and synchronized applications for internet usage is an advantage which is fast bringing ICT into research at the tertiary level.

Lack of Enabling Policies: Inappropriate policies and funding decisions may hinder educational development in developing countries (Gulati, 2008). He further argues that elitism is the most common driver for improper policy. For example, India focuses on higher education, so the poor do not have opportunities to get adequate education and this brings us close to the Nigerian situation.

The Problem Of Dichotomy Between University Degrees And Hnd Certificates

The Nigeria situation is also entangled in a superiority tussle between university degrees and the polytechnic HND certificates. This, no doubt, has brought a negative effect on people's perception of the National Open University and distance-learning programmes with the speculation that an academic who acquires one or more degrees via the NOUN or distance-learning may find it difficult to be accepted as qualified personnel for any academic occupation, especially at the tertiary.

The Catalyst Model

A catalyst is a substance that speeds up the rate of chemical reaction without itself taking part in the reaction.

A catalyst can either help to reduce or increase (induce or inhibit) the process of reaction. It can either be a forward or backward reaction. This study has adopted this analytical model to illustrate how ICT application can either facilitate a growth or reduce a growth process in the educational sector.

Fig.1 A CATALYST B product

Forward. Reaction

The forward reaction above explains the use of ICT as a veritable tool for stimulating a meaningful educational development because reactant 'A' is only able to result to the formation of 'B' product on account of the use of a catalyst (ICT) which increases the rate of reaction as

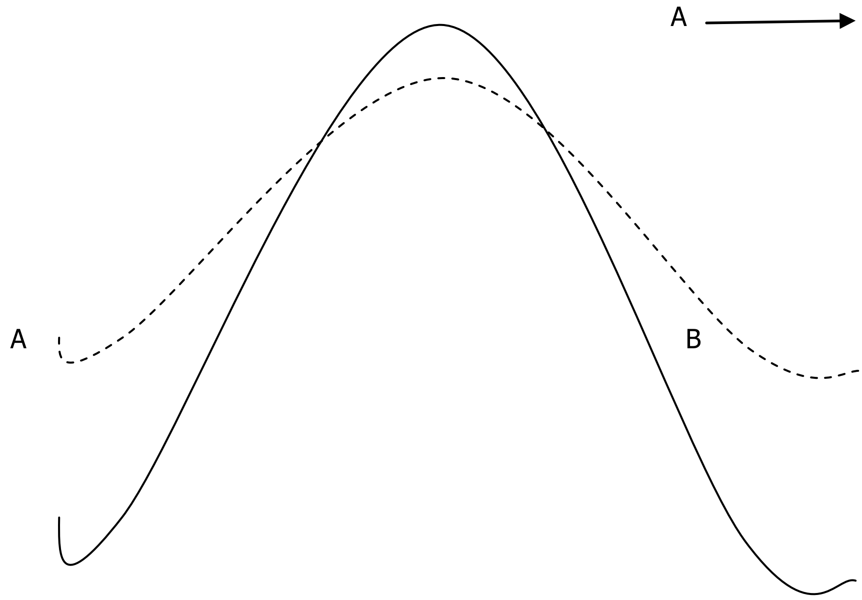
further illustrated below Catalyst

B

Time spent here is

drastically used by the

application of a catalyst



The smooth curve above is the expected times of completion of formation 'B' from 'A' while the broken line of the curve gives the illustration of time/speed gained using a catalyst. E.g the use of potash to fast track the cooking process of beans

Recommendation

Correspondence courses can be adopted as remedial options to upgrade the capacity of students and lecturers in the application of ICTs.

Government should take up more seriously the need to increase budgetary allocation for the education sector, in view of the financial requirement for ICT facilities.

Correspondence courses put in place for students and lecturers to upgrade knowledge in the use and application of ICT will help the Nigerian University system to better handle their post-graduate programmes as supervisors can efficiently supervise students and get progress report on assessment using ICT.

Efforts should be made by government to step up energy supply and to also make available free internet service to both lecturers and students in the academic environment.

Conclusion:

The full-scale domestication of ICT' application in the Nigerian educational sector will help Nigeria cover the gap between its economy and that of the developed nations.

This study has identified poor curricula planning, poor staff straining, policy issues, financing and limited internet access, among other challenges, as factors militating against the optimal utilization of ICT in advancing education. Every of these challenges, however, has corresponding remedies which also carry their implications.

References

Bernett, L.W. & Eutman, R.M. (2001). *Mediated political communication in the future of Democracy*. UK: Cambridge University press.

Chatarvedi, A.K. (2006). *Dictionary of political science*. Nigeria: Epp Books Services Ltd.

Everett, R.M. (2000). Information, globalization and privatization in the new millennium. *The Asian Journal of Communication*, 10(2), 71-92.

Odia, O. (2004). *Education, democracy and development.* In Odion-Akhaine S. (eds.) Governance: Nigeria and the World; Centre for Constitutionalism and Demilitarization pp 150 -.181.

Awolowo, O. (1968). *The peoples republic*. London: Oxford University Press.

Awolowo, O. (1977). *The problems of Africa: The need for ideological reappraisal.* USA: Macmillan Publishers.

Credes, T. & Mansell, E. (1998). *ICT and economic development of nations.* London Heinemanns Educational Books Ltd.

Palfery, J (2004) Internet Politics 2004: *"The good, the Bad and the Unknown,"* in Personal Democracy Forum, 1(4) June 2012.

Gulati, S. (2008) Technology-enhanced learning in developing nations: A review. *International Review of Research in Open and Distance Learning*, 9(1)

Joseph E.I (2000) *Development administration in the less developed countries*. Nigeria: AMFITOP Books.

Kozma R. (1999) ICT and educational reform in developing and developed countries. *Centre for Technology on learning; SRI International, CA viewed 19 March 2010. http: / /rieb2-udg.es/tiec/orals/c17.pd4.*

Oliveira J. (2004) Computer education in developing countries: Facing hard choices. *Education and Computing*, 9(2), 301-311.

Omohan, M.E. (2004).*Educational languages and communication*. Ibadan: Spectrum Book.

Otoikhian, S.K (2007) "Synthesis of Alkylester from Hura Crepitans, Jatropha and Neem Seedoils". An MEng Thesis submitted to the Department of Chemical Engineering: Nigeria; University of Benin.

Parliamentary Office of Science & Technology (2006). ICT in developing countries. *Postnote, no.26, viewed 13 April 2010, http://www.par1iament.uk/ parliamentary-oftice /post/ pubs2006cfm.*

LONG RUN RELATIONSHIP BETWEEN PRICE INSTABILITY AND ECONOMIC GROWTH IN NIGERIA

*__Alasan, A.B__, **__Shaib, I.O__ and ***__Alasan, F. (Mrs.)__
*Department of Humanity, School of General Studies **Department of Statistics,
***Student Affairs Division, Auchi Polytechnic, Auchi

Abstract

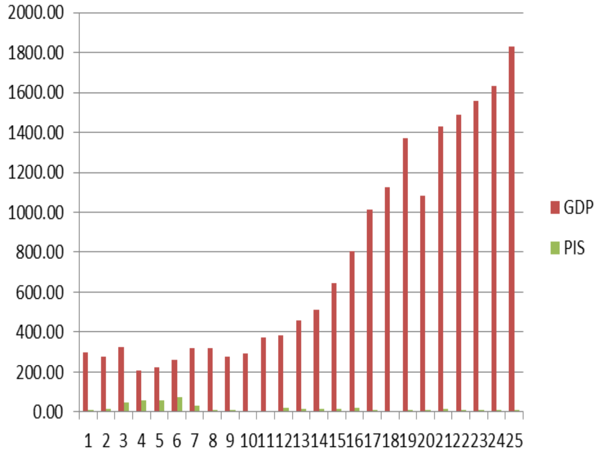
Price instability has taken a centre stage in the determination of economic growth and investment of any developed and developing economy of the world. For this reason, this paper focuses on the long run relationship between price instability and economic growth in Nigeria. Data were obtained from the CBN statistical bulletin 2017. Some econometric techniques are used to analyse the data. The finding from the VAR result output indicates that there is reason to believe that the relations reflect high long run causation term price instability to reduce GDP growth rate by 1.7. Therefore, an average inflation rate by 1unit point per year is estimated to lower per capital GDP impact by 76.6 points annually. The study recommends that proper inflation control and diversification of economic measures should be put in place to discourage inflation scourge and encourage robust GDP in Nigeria.

Keywords: ADF, Price instability, GDP, Significant, Long run

INTRODUCTION

Basically, the rate of economic growth depends primarily on the rate of capital formation, and the rate of capital formation depends on the rate of savings and investment, which is often affected by price instability (Datta and Kumar, 2011). World economic growth and inflation rates have been fluctuating. Likewise, inflation rates have been dominating to compare with growth rates in virtually many years (Madhukar and Nagarjuna, 2011) and relationship between inflation and the economic growth continued to be one of the most critical macroeconomic problems. Similarly, Ahmed (2010) maintains that this relationship has been argued in various economic literatures and these arguments show differences in relation with the condition of world economy order. In accordance with these policies, increases in total demand cause increases in production and inflation too. However, inflation was not regarded as a problem in that period. Rather, it was considered as a positive impact on economic growth which was widely accepted. Amid these views, Phillips first hypothesizes that high inflation positively affects economic growth by lowering unemployment rates. The graphs below illustrate the pattern of GDP and price instability in Nigeria.

This study is very important to economists, financial analyst, academics, policy-makers and Central Bank officials in understanding the responsiveness of GDP to change in general price level and thus come up with the relevant policies so as to keep prices at reasonable rate that stimulate production.



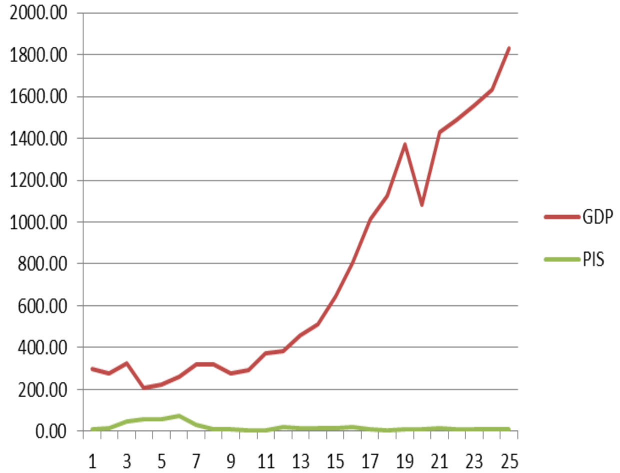


Fig 1. Bar Graph of GDP and PIS

Fig 2. Line Graph of GDP and PIS

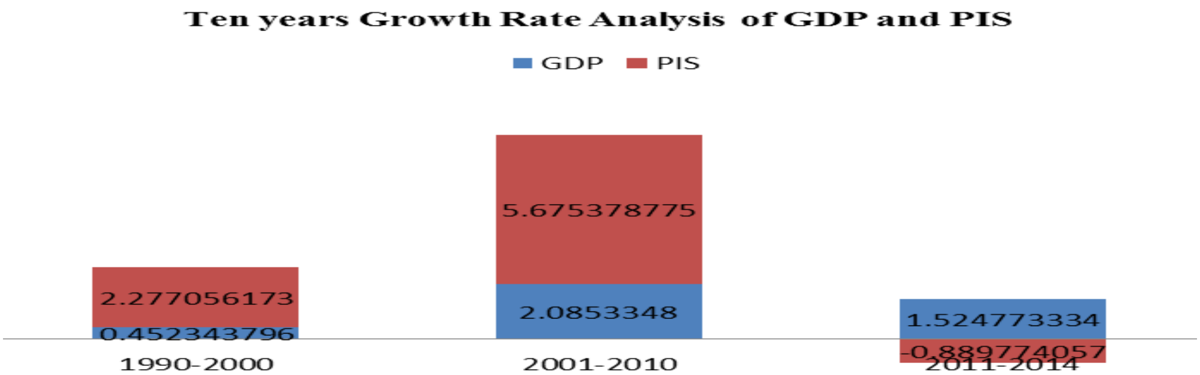


Fig 3. Ten years annual growth rate of GDP and PIS

The graph in fig. 1 above shows the bar graph of price instability and gross domestic product. It shows that GDP has steadily increased from 1990-2014. Inflation has undergone instability within the record years. Line graph clearly reveals that GDP experienced unstable increase from 1990 to 2014 while inflation rate, that is price instability (PIS), indicated rise in 1990-1996 and became relatively stable from 1998-2014. However, the chart in fig 3 illustrates average ten-year real GDP growth rate for Nigeria. From 1990-2000, it was 0.45% but from 2001 to 2010, Nigeria had an annual average growth rate of 2.08%. Since 2011, Nigerian economy experienced many internal and external shocks. All sectors of the economy were affected by shocks, whose manifestations were, among others, large budget deficits, external and internal debt, insecurity resulting to significant drop in GDP to 1.52%.

The average ten-year price instability growth rate for Nigeria from 1990-2000 was 2.27% but from 2001 to 2010, Nigeria had an annual average growth rate of 5.67%. From 2011 till date, Nigerian economy experienced shocks, but balance between productive and non-productive activities was recorded. This is closely associated with low rates of inflation in the recent times despite the drop in the GDP growth in Nigeria. However, in recent years there has been substantial debate on the relationship between inflation and economic growth. Some scholars, mainly those in favour of the Structural and Keynesian perspectives, tend to believe that inflation is not harmful to economic growth, whereas other scholars, particularly those in favour of monetarist views, argue that inflation is harmful to economic growth. Some findings say that there is significant short-run relationship but not in the long-run (Datta and Kumar, 2011). Motivated by this economic controversy, this study investigated the impact of inflation on economic growth in Nigeria.

Objectives Of The Study

Specifically, the study aimed at achieving the following objectives:

i. To examine the impact of inflation on economic growth in Nigeria over the period 1990-2014
ii. To measure the degree of responsiveness of Nigeria economic growth (GDP) to changes in the general price levels (Price Instability).
iii. To establish the relationship between price instability (PIS) and GDP growth rate in Nigeria.
iv.

Empirical Evidence

Sustainable economic growth coupled with price stability continues to be the central objective of macroeconomic policies for most countries in the world today. Among others, the emphasis given to price stability in conduct of monetary policy is with a view to promoting sustainable economic growth as well as strengthening the purchasing power of the domestic currency (Umaru and Zubairu, 2012). The question on whether or not inflation is harmful to economic growth has recently been a subject of intense debate to policy makers and economists. Several studies have estimated a negative relationship between inflation and economic growth. Specifically, the bone of contention is that whether inflation is necessary for economic growth or it is detrimental to growth. It is necessary to policy makers to clear doubt as many studies on the relationship between inflation and economic growth remain inconclusive. Several empirical studies confirm the existence of either a positive or negative relationship between these two macroeconomic variables. For example, Mubarik (2005) found that low and stable inflation promotes economic growth, and vice versa. Also, the study carried by Shitundu and Luvanda (2000) on the effect of inflation on economic growth in Nigeria concluded that inflation has been harmful to economic growth in Nigeria but they did not show the degree of responsiveness of GDP growth rate to changes in the general price levels. This study examined the impact of inflation on economic growth in Nigeria by showing the degree of responsiveness of change in GDP due to change in general price levels in Nigeria and thus filling the existing knowledge gap.

Model Specification

To achieve the objectives of this study, the researchers used three methods of analysis, each for one objective. The study used regression equation (Autoregressive Model) to investigate the impact of inflation on economic growth. Coefficient of elasticity was used to measure the degree of responsiveness of change in GDP growth rate due to change in general price levels. In order to investigate the impact of inflation on economic growth in Nigeria, the researchers modified the model adopted from Khan and Senhadji (2001) for the analysis of threshold level of inflation for Bangladesh.

$$GDP = f(PIS, D, K)$$

1

where:

GDP = Gross Domestic Product

PIS = Inflation Rate

D =Dummy variable

K = Threshold

$$GDP = \beta_0 + LnINFL + DLn(INFL_t - K) + U_t$$

2

Where GDP stands for Gross domestic product, INFL= Inflation, U = error term. The model by Khan and Senhadji, (2001) was modified by the researchers so as to examine the impact of inflation on economic growth in Nigeria as follows:

$$GDP = \alpha_0 + \alpha_1 PIS + U_t$$

3

The expected reaction of price instability (PIS) to economic growth in Nigeria is negative, as inflation or price instability affects many economies and the annual growth rate of GDP, all things being equal. Therefore, the coefficient of α_1 is less than zero.

Methods Of Data Collection And Analysis

The data were sourced from the Nigerian Statistical Bulletin, 2017. Other documents related to GDP and Inflation rate were electronically obtained via annual report of financial data and World Bank Economic Development indicators, 2013. Growth rate of GDP and PIS are computed using the differencing and percentage proportional techniques. A difference is done by subtracting the previous year from current year values of GDP and PIS and divided by the previous year multiply by 100 (see growth rate graph and the data in the appendix for the computational results).The graphical analysis of the data is processed by the author. Econometric tools such as Diagnostic check, Unit root, Co-integration and VAR model are applied to measure whether the two variables (Price instability and economic growth) moved together in the long-run (Engel and Granger, 1987; Gujaratti and Porter, 2009; Seigil, 2009).

Empirical Result And Discussion Of Findings

The empirical analysis of price instability on economic growth in Nigeria shows that the tables 1, 2 and 3 below illustrate the diagnostic check results.

Table 1

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	34.85379	Prob. F(2,21)	0.0000
Obs*R-squared	19.21217	Prob. Chi-Square(2)	0.0001

Table 2

Heteroskedasticity Test: ARCH

F-statistic	14.26704	Prob. F(2,20)	0.0001
Obs*R-squared	13.52213	Prob. Chi-Square(2)	0.0012

Table 3

Ramsey RESET Test
Equation: UNTITLED
Specification: GDP PIS C
Omitted Variables: Powers of fitted values from 2 to 3

	Value	df	Probability
F-statistic	0.206174	(2, 21)	0.8153
Likelihood ratio	0.486132	2	0.7842

From the tables above, the probability values of F-statistic for the serial correlation and Heteroskedasticity are 0.000, which is less than 0.05 at 5% less. This indicates that the residual of the model parameters of price instability on GDP is not serially correlated and it is homoscedasticity. To investigate the functional form of the model is stable as the probability of the Ramsey reset test is 0.8153 and it is greater than 0.05 at 5%. However, the test for normality fail as the probability value of Jaque-bera is 0.404 indicating that the residual of the model is not normally distributed at 5% level. As a result of the violation of OLS model application. Unit root of the variables are tested for stationarity.

Table 4: Unit Root

Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on AIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.151599	0.0000
Test critical values:	1% level	-3.752946	
	5% level	-2.998064	
	10% level	-2.638752	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: PIS has a unit root
Exogenous: Constant
Lag Length: 5 (Automatic - based on AIC, maxlag=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.602796	0.0000
Test critical values:	1% level	-3.831511	
	5% level	-3.029970	
	10% level	-2.655194	

The test of unit root using Augmented Dickey Fuller Test (ADF) suggests that the variables-Gross Domestic Product (GDP) and Price Instability (PIS) are jointly stationary at 5% since the ADF values (-6.1516 and -8.6027) are greater than (-2.9981 and -3.0299) critical value at 5%. Therefore, the variables are stationary at order 2 and order 1 respectively. There is no unit root and confirms co-integration and Vector Autoregressive approach for model parameter estimation procedure.

Table 5: Johansen Co integration

Sample (adjusted): 1992 2017
Included observations: 23 after adjustments
Trend assumption: Linear deterministic trend
Series: GDP PIS
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None*	0.321688	19.93481	15.49471	0.0101
At most 1	0.122569	3.007413	3.841466	0.0829

Trace test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

In table 5 above, Johansen co-integration test result reveals that the value of the trace statistic 19.93 is greater than the critical value (15.49) having probability value of 0.010 which is less than 0.05 at 5% level. The result suggests that the variables (GDP and PIS) are co-integrated at none* indicating at least 1 co-integrating equation. This means that the selected variables move in long run equilibrium and the dependent variable can be sufficiently measured by price instability.

Table 6: VAR Model Estimate

Vector Autoregression Estimates
Sample (adjusted): 1992 2017
Included observations: 23 after Adjustments
Standard errors in ( ) & t-statistics in [ ]

	GDP
GDP(-1)	0.575024
	(0.20780)
	[2.76719]
GDP(-2)	0.498515
	(0.21830)
	[2.28360]
C	78.37974
	(64.1535)
	[1.22175]
PIS	-1.706727
	(1.48384)
	[-1.15021]
R-squared	0.961305
Adj. R-squared	0.955196
Sum sq. resids	252659.1
S.E. equation	115.3163
F-statistic	157.3412
Log likelihood	-139.6351
Akaike AIC	12.49001
Schwarz SC	12.68748
Mean dependent	779.1739
S.D. dependent	544.7917

Estimation Proc:
===============================
LS 1 2 GDP @ C PIS

VAR Model:
===============================
GDP = C(1,1)*GDP(-1) + C(1,2)*GDP(-2) + C(1,3) + C(1,4)*PIS

VAR Model - Substituted Coefficients:
===============================
GDP = 0.575023628256*GDP(-1) + 0.498515323578*GDP(-2) + 78.3797372779 - 1.70672672385*PIS

The VAR estimated model indicates that the coefficient estimated value of α_1 is -1.706 which implies indirect relationship between economic growth and price instability in Nigeria. Changes in price instability result in negative decrease in GDP by 1.71. This reveals that price instability (PIS) impacted negatively on Economic growth (GDP). This is because there are other operating economic variables for GDP growth in Nigeria outside oil and gas such as small scale and medium industry, coupled with agricultural sector which focuses on the majority of the Nigerian populace. Therefore, any increase in prices of such product will account for negative shock of price instability on economic growth in Nigeria.

The results of test of significance reveals that the t-statistic based on the rule of thumb and F-statistic are used to test hypotheses for the individual variables and overall significance of the model. F-statistic is 157.53 while that of F-table at 5% level of significance is 2.51. As $F_{cal} > F_{tab}$, It implies that there is overall statistical significance between GDP and price instability (PIS).

The value of T-ratio for the coefficient of price instability (PIS) is -1.150, which is far less than the 2.0 rule of thumb when electronic method of data analysis is adopted. The PIS is not significant to economic growth. The exogenous variables demonstrate 0.49 and 0.57 positive on the GDP in the previous (-2) and current year (-1) and are statistically significant at 5% level. This implies that there is long run relationship between GDP and price instability in Nigeria. The degree of association between the variables is 0.991. This suggests that the correlation between the exogenous and endogenous variables is 99.1%. The model estimate is found to be highly fitted at 95.1% as the R^2 value is 0.951. To investigate the extent to which price instability explains the variation in economic growth in Nigeria, Adj.R^2-squared is 0.955, implying that about 95.5% variation in economic growth is explained by the exogenous variable (Price Instability) in Nigeria.

Table 7

Pairwise Granger Causality Tests
Sample: 1990 2017
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
PIS does not Granger Cause GDP	23	0.33922	0.7168
GDP does not Granger Cause PIS		0.96264	0.4007

Price instability does not granger cause economic growth in Nigeria. This result is very important in the probability value of the associated F-stat being less than 0.05 at 5% significant level. On the whole, price instability does not really influence GDP in Nigeria.

Conclusion And Recommendations

To achieve the set objectives of this paper, a major finding from the empirical analysis is that the estimated effects of price instability on economic growth is statistically negative when some plausible instruments are used in the statistical procedures. In addition, based on VAR result output, there are some reasons to believe that the relations reflect high long run causation term price instability to reduce GDP growth rate by 1.7. Therefore, an average inflation rate by 1unit point per year is estimated to lower per capital GDP on impact by 76.6 points annually. The study recommends that proper measures such as inflation control and diversification of economy should be put in place to discourage inflation scourge and encourage robust GDP in Nigeria.

REFERENCES

Ahmed, S. (2010). An Empirical Study on Inflation and Economic Growth in Bangladesh. OIDA International Journal of Sustainable Development, Vol. 2, No. 3, pp. 41-48.

Datta, K. and Kumar, C. (2011). Relationship between Inflation and Economic Growth in Malaysia. International Conference on Economics and Finance Research IPEDR, Vol. 4, No. 2, pp. 415-16.

Engle, R. F. and Granger, C. W. J. (1987). Co-integration and Error Correction: Representation, Estimation and Testing. Econometrica, Vol. 55, No. 2, pp. 251-276.

Gujarati, N. and Porter, D. (2009). 3rd edn. Basic Econometrics. US: The McGraw-Hill.

Gujarati, N. (2004). 4th edn. Basic Econometrics. New York: The McGraw-Hill.

Madhukar, S. and Nagarjuna, B. (2011). Inflation and Growth Rates in India and China: A Perspective of Transition Economies, *International Conference on Economics and Finance Research*, Vol. 4, No. 97 pp. 489-490.

Mubarik, A. (2005). Inflation and Growth. An Estimate of the Threshold Level of Inflation in Pakistan. SBP- Research Bulletin, Vol. 1, No. 1 pp. 35-43.

Ramanathan, R. (2002). 5th edn. Introductory Econometrics with Applications. Fort Worth: Harcourt College Publishers.

Sergii, P. (2009). Inflation and Economic Growth: The Non-Linear relationship. Evidence from CIS Countries, Kyiv School of Economics, Ukraine.

Shitundu, L. and Luvanda, G. (2000). The Effect of Inflation on Economic Growth in Tanzania, *African Journal of Finance and Management*, Vol. 9 No. 1, pp. 70-77.

Umaru, A. and Zubairu, J. (2012). The Effect of Inflation on the Growth and Development of the Nigerian Economy: An Empirical Analysis, *International Journal of Business and Social Science*, Vol. 3, No. 10, pp. 187-188.

Wei, S. (2006). 2nd edn. Time Series Analysis: Univariate and Multivariate methods. Boston:

Pearson. Xiao, J. (2009). The Relationship between Inflation and Economic Growth of China: Empirical Study from 1978-2007, Lund University, Sweden.

Yang, H. (2000). A Note on Causal Relationship between Energy and GDP in Taiwan, Energy Economics. Vol. 22, No. 3, pp. 309-317.

SOURCES AND INFLUENCE IN MODERN AFRICAN DRAMA
A JOURNAL ARTICLE

PRESENTED BY:

AIYEDUN, SAMUEL MONDAY
DEPARTMENT OF LANGUAGES
AUCHI POLYTECHNIC,
AUCHI
e-mail: samtoria@yahoo.com
Phone: 08036168807

AND

BRAIMAH, MUSA
DEPARTMENT OF LANGUAGES
AUCHI POLYTECHNIC,
AUCHI
e-mail: musasbraimah@gmail.com
Phone: 08056151548

Abstract

Does literature in English still hold any relevance in a technology-driven society? The subject is gradually losing its pride of place on our educational curriculum. This is regrettably unfortunate especially with the surreptitious attempt to obliterate our true history as a nation. Literature in English, especially the dramatic genre, was erstwhile the saviour we looked up to, to faithfully, albeit in literacy terms, capture our history. The wrong notion that African Literature is a mere appendage of the Western version needs to be readdressed also. The researchers have therefore sought to use this paper to remind the academia of the relevance of the subject and thus to set the records straight with regards to the sources and influences in African drama. The emergence of 'Nollywood' and consequently the dearth of novel literary impetus necessitate a call to go back to the status quo: reinstating Literature (Drama genre especially) as a veritable instrument of education and entertainment.

Keywords: African Literature, drama, sources, influences.

Introduction

Drama, like other art forms, undeniably reflects ways of ordering the society on which it is based (Umukoro, 1994:9). Art is a criticism of life. In particular, through fiction, literature addresses itself to life and it responds to a specific set of political, economic and social-cultural conditions. Umukoro (1994) further opines that entertainment in Literature is not an end but a means for the writer to explore the realities of the human condition. He quotes Moody (1968) who says Literature speculates not only what is, but on what ought to be, or what might be. Brecht (1966) supports the claim further by positing that drama should be an affair for philosophers, especially such who wished not just to explain the world but to change it. Soyinka (1968) equally opines that the artist has always functioned in African society as the record(er) of the mores and experiences of his society and as the voice of vision in his own time. Armah (1984) shared similar views when he affirms that it has been the prime destiny of the serious African artist to combine the craft of creativity with the search for regenerative values. Achebe (1975) had earlier submitted that the African writer who tries to avoid the big social and political issues of the contemporary Africa will end up being completely irrelevant like the absurd man in the proverb who leaves his house burning to pursue a rat fleeing from the flames. The African writer is obviously obsessed with regenerative values while seeking to transform his society for the better. No wonder, Agho (1996) says that African writers have consistently written against moral failures, prevalent social ills and injustices celebrated in the society.

From the above background, it becomes easy to see what direction this article is intended, what passion drives the impetus of the writers and what theoretical framework they intend to present.

Sources And Influences

Africa is highly endowed, culturally speaking. It is also undeniable that her historical experience is a chequered one replete with several ups and downs, failures and successes, etc.

Historically, three major events generated the contents of most African drama, namely,: Colonialism, Apartheid and Independence. This, however, does not rule out the fact that there is the element of imagination in all the genres of African literature.

Banham (1995), Brocketh and Hildy (2003) and Goldhill (1997) all agree that the history of theatre charts the development of theatre over the past 2,500 years. They assert that while performative elements are present in every society, it is customary to acknowledge a distinction between theatre as an art form and entertainment and theatrical or performative elements in other activities. Since classical Athens, in the 6th century BC, vibrant traditions of the theatre have flourished in cultures across the world.

Theatre arose as a performance of ritual activities that did not require initiation on the part of the spectator. Aristotle, in his POETICS, claims theatre did not expect or require the spectator to fast, drink the Kykeon or march in procession; however it did resemble the sacred mysteries in the sense that it brought purification and healing to the spectator by means of a vision, the *theama.* The physical location of such performances was accordingly named *theatron.* Oscar Brocketh and Franklin Hildy, both historians, opine that rituals typically include elements that entertain or give pleasure such as costumes and masks as well as skilled performers. As societies became more complex, these spectacular elements began to be acted out under non-ritualistic conditions. As this happened, the first steps towards theatre. As an autonomous activity, was being taken. The Egyptian passion plays were performed annually to celebrate the mythical and divine king Osiris. It depicts the struggles and triumphs of the Egyptian king and god.

Waterworth (2017) declares that it is interesting to note that the Greek theatre that flourished between 600BCE – 400BCE relied on the cult ceremonies of the fertility and wine god Dionysus. In these performances, female adherents or devotees danced themselves into a state of trance, and also ripped apart and ate the raw flesh of sacrificed animals. The Dionysians later developed a more structured theatre. Indeed, it was Thespis, the Dionysian priest, who introduced a new element to the Greek theatre. He engaged in a first ever dialogue with chorus; and in that way became the world first actor. This event actually marks the birth of theatre as it is recognized globally today.

The European had a misconception of Africa as a dark continent without a culture or with an inferior culture. Thus, they saw their coming to Africa as an expedition to bring light and a better culture to the 'crude and uncivilized dark continent'.

The quest to erase this wrong notion thus became the thematic preoccupation of the early dramatists who portrayed Africa as a culturally rich land. The way the white colonialists plundered Africa was the background against which they wrote. They attacked the Europeans vociferously through their budding literary efforts asking them to vacate the African continent. Drama was thus used as an instrument of anti-colonial propaganda. The political crisis, therefore, was the imposition of British rule in Nigeria and dramatists like Hubert Ogunde in *Bread and Bullet* protested against foreign domination, asking for an independent political order. The miners strike of November 8, 1949, that led to the shooting to death of eighteen miners inspired the writing of the play. The West African Pilot newspaper of 25th October, 1950 on page 3, reported the way it was performed and the incidents which followed.

In his pioneering study of Yoruba theatre, Joel Adedeji (1969:60) traced its origin to the masquerade of the 'Egungun' (the ancestral cult of Yorubas), in festivals depicting the ancestors' return to the earth to visit their descendants. (Cited by Money, 2005; 26).

The Yorubas had a large divinity pantheon that had a 'theatrogenic' nature, with the likes of 'Obatala' (the arch divinity), 'Ogun' the god of iron and technology (Gibert Helen (2001), 'Sango' the god of storm/thunder whose relevance is usually portrayed as dramatically theatrical.

The 'Alaarinjo' theatrical tradition emanated from the Egungun masquerade from Oyo Igboho. The 'Alaarinjo' (translated from Yoruba language to mean a troupe of travelling performers) often wore masks to bear an air of mystique. Their modes of performances was *mime, music* and acrobatics; with which they created short, satirical scenes that drew on several established stereot ypical characters. It is worthy of note that their tradition had a great influence on the popular travelling theatre which became quite common-place between the 1950s and the 1980's.

Banham, Hill and Woodyard (2005) report that in the 1990's, the popular travelling theatre graduated into television and film and now gives live performances only rarely.

'Total theatre' also developed in Nigeria in the 1950s. It adopted non-naturalistic techniques. (a style that deviated from the naturalistic literary mode of trying to show the world and people exactly as they are), surrealistic (strange art form that combines many unusual, unrelated events, images) physical imagery and exercised a flexible use of language. Playwrights who wrote in the mid-1970's made use of some of these techniques, but articulated them with a radical appreciation of the problems of society.

Traditional performance modes have strongly influenced major figures in modern Nigerian theatre. Banham, et-al (2005) report that the works of Hubert Ogunde (sometimes tagged father of contemporary Yoruba theatre) was informed by the 'Alaarinjo' and 'Egungun' masquerade. They also opine that Wole Soyinka, the legendary, African's greatest living playwright and Nobel Laureate, gives Ogun a complex metaphysical significance in his works. Soyinka (1973), in his essay "The fourth stage", draws a sharp contrast between Yoruba drama and classical Athenian drama, relating both to the 19th C German philosopher Friedrick Nietzsche's analysis of the latter in "The Birth of Tragedy (1972). 'Ogun', he argues, is a totality of the Dionysian, Apollonian and Promethean virtues.

It is pertinent to remark here that Hubert Ogunde's pioneering effort and genuine passion for the kind of African theatre that maintains accurate traditional African forms of the belief system, common values, folklore of the people is quite commendable. The subsequent efforts of the like of Duro Ladipo, Moses Olaiya (aka Baba Sala- a popular comic art) further contributed much to help launch and promote African theatre during the period of dramatic syncretism and experimentation of the indigenous with the Western theatre.

Nwahunanya (1998) asserts that the literary history of a period usually includes the contribution of the intellectual giants of that age to the spirit of the age. These giants, who most times set their ideas down in written form share the society's felt needs. It is on this basis that this paper x-rays the works of several African dramatists with the aim of exploring the sources and influences of African drama.

Apartheid was another historical event that influenced the content of the writings of modern African writers. Apartheid means separation (apartness), racial discrimination in religion, social economic and political spheres of life. Under this obnoxious policy, the Africans were totally suppressed and dehumanized. Athol Fugard in *Sizwe Bansi is Dead* (1974) explores the theme of apartheid while drawing our attention to how the issue of colour bar negativity affected the blacks in south Africa during the period. Most of the plays in the anti-apartheid tradition were written to draw international attention and sympathy for the oppressed black race.

The attainment of independence meant a shift in thematic focus of African drama. The pre-independence mood of anticipation and excitement gave way to that of disillusionment and despair. The nationalist elites who took over power from the colonialists were only concerned with how to preserve their privileges, dominate and exploit the masses, and to perpetuate the culture of dependency in the continent. This appalling culture continues till date. Since then, modern African dramatists have been preoccupied with the crises of neo-colonialism in a search for a true African democracy. Thus, contemporary problem of nationhood like corruption, embezzlement and misappropriation of public fun, bribery tribalism, nepotism and civil service ineptitude have incensed the nationalistic temperaments of African writers. J .P. Clark's play the Raft (1964) is a symbolic representation of the Nigerian nation designed to caution the people that the nation has gone astray and is plunging to her doom if cautionary measures are not adopted. In similar fashion. Soyinka deals with urgent contemporary socio-political problems in Nigeria and Africa as a whole. These include corruption, fraud, religious hypocrisy, in the *Brother Jero* (1964) and *The Interpreters* (1965); the struggle for power and authority in Africa in Kongi's Harvest (1967; the Nigeria civil war in *Mad Men and Specialist* (1971) and dictatorship in Africa in *Opera Wonyonsi* (1981) and *A Play of Giants* (1984). His attention was focused on environmental issues and despotism cum other forms of misuse of political power in the *Beatification of Area Boy* (1995) and *King Baabu* (2000) respectively.

From the above instances, we see that African plays are influenced by the unwholesome conditions of the society and the writer's belief that there is room for change makes him to profer the antidotes for improvement or change. As Agho (1996) puts it, the African dramatist is the society's watchdog. He not only satirizes the follies and absurdities but also suggests an alternative course of action' (p 134).

As observed earlier, African drama is sourced by the rampage of Western financial forces to repossess and recolonize Africa. This sentiment is echoed by Nwakwo (1990) who reasons that the African political crisis is treated as a product of the evil rule of the capitalist bourgeoisie in which a tiny minority enriches itself by expropriating the vast majority of the population (cited Umukoro:15).

According to martixt ethos, religion is the opium of the people and goals are illusory. In Femi Osofisan's *No more the wasted Breed* (1982), belief in the supernatural must be rooted out and exterminated and so too are religious beliefs and practices, the gods, and the mythical among the people must be destroyed. This play seems to attack Soyinka's play *The strong Breed* (1964), in which the latter exploits the Yoruba corruption of the '*carrier,* a figure who mediates between the natural and the supernatural entities who are allowed to co-exist in the microcosm of the African's religious experience of his universe and cosmogony.

Ogunba (1975) claims that the Yorubas regard 'the carrier' as their ambassador to the country of the supernatural beings. Soyinka's, portrayal of this belief is concomitant with his conviction that the sacrifices made by the carrier is a scale of reality towards which Nigerians and indeed all African elites should constantly strive. Thus, in Africa, the balance of blame and liability in the relationship between man and the gods is a complex issue, and writers have sought in their dramaturgy to reflect this complexity.

As a visioner and the voice of his own time, the African dramatist has always been quick to criticize and lampoon the foibles of the political bourgeois class. The majority of these so-called leaders got to the top echelons' of government via corrupt means even when they are not qualified or capable. Thus the cult of mediocre is saddled with the onerous task of governance. The worst result can be expected. No wonder Africa is yet to attain a state of el-dorado. James Ene Henshaw aptly captures this in *Dinner for Promotion* (1967). Osofian's A *Restless Run of Locust* (1957) depicts our political class as a rampaging swarm of locusts, stashing away public funds into their private accounts. The situation has not changed.

The issue of the clash of cultures-modern versus the traditional in the new Africa-forms the basis of most African plays. *Ozidi* (1966) is a play where J. P. Clark strove to preserve an African myth and legend from going extinct. In *This is Our Chance* (1956), James Ene Henshaw pitched the character of Bambulu (representing modernity) against the crudity of *Chief Damba* (representing tradition) in their approach to issues. Ama Ata Aidoo's play, *The Dilemma of a Ghost* (1965), mirrors the ways of the Akan people of Ghana. The play treats issues like the question of fertility/family planning, in the African society, the dilemma of an educated and American trained African (Ghanaian) on his return home from studies abroad, carrying with him all the western values acquired from Western education. This problem is raised constantly in African drama as well as other generational conflicts. Modernity has vandalized African manners and honesty as we see in J. C de Graft's play *Sons and Daughters* (1964).

Historical events are not in short supply in Africa. Ranging from the inter-tribal wars to African monarch's colonial conflicts, we have much dramatic impetus that aptly captures these experiences. Kurunmi (1971) and Ovonramwen Nogbaisi (1974) by Ola Rotimi faithfully re-enact these phases in the African historical experience. The British colonialists saw Oba Ovonramwen of the Benin Kingdom as the most abominable despotic sadist whose trial and ultimate exile to Calabar took place in the 19^{th} C (1888 – 1897). Rotimi used the play to correct the wrong notions of the Whites about Oba Ovonramwen. He was a man more sinned against than he ever sinned. The turbulent rhythms of war displayed in the 19^{th} century Ijaye war in the new Oyo empire saw the Alafin Atiba of Oyo and Kurunmi, the Are-Ona Kakanfo of Ijaye clash in a fierce war.

Most African drama is loaded with allusions. By this, it is being asserted that such African drama derives from the works of foreign writers'. Ola Rotimi's *The Gods Are Not to Blame* (1975) is the playwright's version of the Greek mythical tragedy of Oedipus written by Sophocles.. Commenting on the classical temper in modern African drama, Ashaolu (1982) opines thus:

> "The great influence of Greek drama on modern Africa drama has been in evidence for about two decades. The classical tracts in dramatic works by Africans is quite glaring in the forms of (i) transposing the exempla of morally (ii) the fate of legendary personages in classical tragedies into the peculiar African atmosphere to suit the cultural flavor and demands of the playwright". (pp. 77 – 91).

The Greek tragedies' foster the restoration of a state of equilibrium after tampering with the natural order. Clark's *Song of a Goat* (1964) was influenced by the Greek concept of T*ragoidia* which translates as goat song – the ancient ritual sacrifice of a goat associated with Dionysus, the ancient Greek god. In clark's version, Ebiere and Tonye commit incestuous sexual union which is as a result of an inherited curse because Zifa was not given to the people of the sea as hand –maiden. This action constitutes a disturbance of natural order, and like their Greek model of Aeschylas', attempts to normalize things is made in the play. Wole Soyinka's play, the Bacchae of Euripides, adapts the Greek original titled Euripides' Bacchae.

It was a play he found relevant for the articulation of his struggle for social justice and self liberation. It should be mentioned that while drawing from these classical works, the African dramatists were not mere copy-cats, rather they adopted them to inform the world of a 'novel art' form in Africa which needs people to exploit the theatre medium to guide society against treading the path of destruction. By identifying with the vision of the Greek tragedians, the African dramatists successfully created the conditions in which Africans could get a clearer vision of their own society.

Africa drama is a child of this world: the African and Western world. African, in so far as it draws extensively from African sources; being domesticated in Africa; and Western, in terms of stylistic influence from western writers. Having studied abroad, Ezra Pond learnt to use symbolisms and fragranted statements; Wole Soyinka developed the structural symbolism underlying dramatic ritual from George Wilson Knight as a student in leeds in 1957. He was equally influenced by Gerald Manley Hopkims especially in the use of alliteration, other literary techniques like satire, suspense, chorus, Deux-ex-Machina, in media rest in the African drama.

It is undeniable that most African playwrights have sought to use their art to express several dogmas and schools of thoughts. The dogmas of Marxism, for example, is at the base of the trial of Dedan Kimathi (1976) by Wa Thiong'o and Mugo. In this play, they explore the condition in Kenya from a diachronic point of view' (Umukoro 1994; 28). The play outlines the vision of struggle against the strong capitalist/imperialist forces that enslaved and stole the wealth of the Africans. Other concepts like Femininism and womanism have recently crept into the African dramatic environment.

Modern African drama is sometimes influenced by African oral tradition as dramatists sometimes look back to the rich repository of indigenous mythologies, folktales, songs, festivals, etc. The use of narrator, chorus, etc, a common feature of African folklore tradition has featured in many African drama. The use of popular African proverbs, riddles, idioms and imagery is drawn from the artiste's immediate environment. There is a profuse use of these in Ola Rotimi's *The Gods Are Not to Blame* (1975). Traditional music, dance songs, folk drama and opera all influence modern Africa drama.

As Reuben Abati (1990) explains, it remains to state that another important aspect of recent Nigerian drama which deserves analysis is its experimental nature. This is found in the determination to transcend orthodox aesthetic limit and to create a drama that bears, in all implications, the structural restlessness of its own age. These dramatists return to traditional roots to exhume ethnic paraphernalia for the interpretation of contemporary reality without ethnic bias'. In Tess Onwueme's plays, notably, *The Broken Calabash* (1994), The reign of Wazobia (1998) and legacies (1989), there is a conscious, deliberate flirtation with the ethos and nuances of the Igbo culture used primarily to authenticate the cultural setting of the drama and to introduce theatricality and colour as well as enhance metaphor.

But, perhaps, the most central achievement of recent Nigeria drama, and by implication, African drama, is the emergence in literary form of a concern for children. Children theatre has for long been a popular subject in academic discourse but it is only recently that conscious efforts have been made to translate this concern into concrete reality of literature. Yahaya S. Dangana's the *Barber's Nine Children* (1987) and Irene Salami's *Short Play for Junior* (1986) are examples.

Recently, however, there has been a call to switch gear, as Agho (2009) once again opines:

> "We should also stress that it is time Nihilism and unbridled pessimism
> gave way to reformism backed by genuine commitment to art. Social
> criticism as an artistic creed is desirable, but it must be made to wear
> a human face… (Agho 2009: 205).

It is along this line that Femi Osofisan offers the following literary advice: "There is a need to counter this new literature of incurable angst with another that offers a more positive perspective of life, a literature that will encourage us to struggle and not to be beaten down by despair" (2009: 79).

This recent call for a change of bearing has been heeded by several recent African playwrights. Prominent among them is Ahmed Yerima Parker whose growing list of dramatic work is quite impressive. Some of his work include the silent Gods (1994), Kaffir's last Game (1998). The sick people (2000), Otaelo (2003), Attahiru (1999), etc.

Conclusion

As we have see in this paper, African drama has derived from several sources and it has been variously influenced. Written and unwritten records show that African literary tradition is characterized by a dynamic creative temper. Jeyifo (1991) contends that in the African tradition, literature (drama in this context) is a socio-cultural institution. It is produced and received as a valuable contribution to the understanding of the true goals of society. In this fashion, the writer is seen as a promoter of explicit social, political and moral values crucial to the survival of the society.

From the above disquisition, it is glaring that there is no dominant source of influence in African drama but a mixture of several sources. Experimental writings and neologisms have also been incorporated in this dramatic terrain. African drama is rich and vibrant, and despite the emergence and influx of home videos, its bright prospects cannot be dampened; and with incidence of insurgency, militancy, kidnapping, economic recession, bad governance, insecurity and other vices on the rise in Africa, contemporary African playwrights definitely have their pens dripping with sources and influences.

References

Abati, Reuben. (1990) 'Recent Nigerian Dramatists: context, Attitudes and Patterns: *The Guardian,* Lagos *Guardian* Newspaper Plc.

Achebe, Chinua (1975) *The African Writer and the African Cause:* Morning yet on creation Dary. London: Neinemann.

Adedeji, Joel (1969). 'Traditional Yoruba Theatre' in African Arts 3.1 (Spring 60 – 63) JSTOR 333461'.

Agho, Jude A (1996) *Towards a Literature of Socio-political and Cultural Commitment in Africa.* Aghor: Pon Pub. Ltd. Pp 33 – 45.

- - - - - The Nigerian Novel and the Imperative of Good Governance: A critical study of Joseph Edoki's '*The African Dream'* Published in Ethics, Standard and Accountability in Governance (Eds) V. O. Aghayene and F. E Iyoha, Benin – City: Institute for Governance and Development, AAU, Ekpoma, 2009. Ch 12 pp 195 – 207.

Aido, Ama Ata (1965) *The Dilemma of a Ghost*. England: Longman,

Armah, Ayi Kwei (1984). Masks and Marx: The Marxist Ethos Vis-à-vis African Revolutionary Theory and Praxis. *Presence* Africaine No 3. 1984.

Ashaolu, Albert O. (1982) 'The Classical Temper in Modern African Drama' in *Comparative Approaches to modern African Literature* Ed. Asein, S.O. Ibadan: University of Ibadan Press pp. 77-91.

Athol Fugard (1974) *Sizwe Bansi is Dead*. *Statements*. New York. Oxford University Press.

Banham, Martin (ed. 1995) *The Cambridge Guide to Theatre*. Revised Edition. Cambridge, Cambridge University Press.

Banham, Martin, Errol Hill and George Woodyard. (eds. 2005) *The Cambridge Guide to African and Carridbean Theatre,* Cambridge Univ. Press,

Brecht, Bertolt. (1966). Theatre for pleasure or theatre for instruction; *Brecht on Theatre*. Trans.J. Willet. London: Matheun, 1964.

Brockett, Oscar G. and Franklin J. Hildy (2003) *History of the Theatre*, 9th ed; Tran, International edition, Boston: Allyn & Bacon.

Clark, J. P. (1996) *Ozidi* London: Oxford,

- - - - - *Song of a Goat*, London: Oxford, 1964.

- - - - - *The Raft in Three Plays*. London: Oxford 1964.

Green, D and R. Lattimore, Eds 1960) *Alcestis in Green Tragedies* Chicago: University of Chicago Press. Pp 254 – 285.

Henshaw, James Ene (1967) *This is our chance*. London: Hodder and Stoughton, 1967.

- - - - - *Dinner for promotion* London: Hodder and Stughton 1967

Jeyifo, Biodun (1991) " Introduction". Maduakor, Obi, Wole Soyinka: *An Introduction to this writing.* Ibadan: Heinemann.

J. C. de Gratt (1964) *Sons and Daughters.* London: Oxford University Press, 1964.

Nwahunanya, Chinyere (1995) *Issues in Literary theory, History and Criticism,* Owerri: Corporate Impression.

Nwankwo, Arthus (1990) *Perestroika and Glasnot:* Their Implications for Africa. Enugu: Forth Dimensions Publisher.

Ogunba, Oyin (1975) *The Movement of Transition:* A Study of the Plays of Wole Soyinka. Ibadan University Press, 1975.

Ola Rotimi (1974) Ovoramwen Nogbaisi. Ibadan: Ibadan University Press Ltd. 1974.

- - - - - *Kurunmi:* Ibadan, University Press Ltd, 1971.

- - - - - *The Gods are not to Blame*, London: Oxford University Press, 1975.

Oscar Water worth (2017) *A short History of Ancient Theatre*, New history. Com, retrieved 9th Feb., 2018.

Osofisan, Femi (1979) *No More the Wasted Breed in Morountodun and Other Plays*, Ikeja: London.

- - - - - *A Restless Run of Locust*, Ibadan: Onibonoje, 1957.

- - - - - *The City as Muse: Ibadan and the Efflorescence of Nigerian Literature*. University Lectures, University of Ibadan, 2004/2005: Ibadan: Hope Publication Ltd., 2007.

Soyinka, Wole (1963) *A Dame of the Forests* London: Oxford University Press, 1963.

- - - - -*A play of Giants* London: Methuen Books, 1984.

- - - - - *Mad Men and Specialist*: London: Methuen 1971.

- - - - - *The Trails of Brother Jero*: London: Oxford Univ. Press, 1964.

- - - - - *The Beautification of Area Boy*: A Lagosian Kaleidoscope, London, Methuen Drama, 1995.

- - - - -. *King Baabu*, London, Methuen Drama 2002.

- - - - - The Writer in a Modern African State". Par Wartburg (Ed) The Writer in Modern Africa. Uppsala: Scandinavian Institute of African Studies.

- - - - - "The Fourth Stage, Through the Mysteries of Ogun to the Origin of Yoruba Tragedy" in '*The Morality of Art: Essay Presented to G. Wilson Knight by his Colleagues and Friends* Ed. Doughlas Milliam Jefferson. London: Routledge and Kegan Paul, 1973 pp 119 – 134.

Umukoro, Simon O. (1994) *Drama and Politics in Nigeria*; Ibadan: Kraft Books Ltd. Pp 9-19, 31 & 33.

WOMEN EMANCIPATION AND NATIONAL DEVELOPMENT: THE HORTATIVE EXAMPLE IN OLA ROTIMI'S *OUR HUSBAND HAS GONE MAD AGAIN*

MOMOH A. ODION AND UDEVBURE ANGELA

FOR THE

JOURNAL OF ARTS, ARTS, MANAGEMENT, SCIENCE AND TECHNOLOGY (JAMST)
AUCHI POLYTECHNIC, AUCHI

Edo State

Abstract
The marginalization of women and the concomitant retrogression inherent in the behavior has spurred both men and women to enunciate a campaign for the emancipation of women, in order to enable a collaborative effort towards national development. A number of methods have been adopted to exhort the women folks to see their emancipation as realizable, one of which is the literary mode. Based on this pedestal, this paper evaluates Ola Rotimi's Play, our Husband has gone mad Again, in order to bring to the fore, how the author uses his work to encourage women to begin to see the realization of their emancipation as a possibility. While concluding with a reaffirmation that for any society to experience development, the input of both sexes is a sine-qua-non, one important recommendation is made: women must begin to repudiate the notion that they are the weaker sex.

Introduction

To emancipate someone is to set that person free from any form of social, political cultural or legal restriction so that the person begin to access and enjoy those things from which they hitherto were barred. Emancipation in this context, therefore, replicates the concept of gender equity as it relates to women along the lines ofvocation, culture and even education. There are certain vocations over which men have a monopoly, at the detriment of women. Culturally, there are certain areas which do not accommodate women and educationally, men also have a great advantage over the women. For example Bello-Iman(1995) writes that:

> *People in South Ibie clan regard education of girl as a liability rather than an asset. Their argument is that after spending huge sums of money on their education, they are usually married out to a man who takes over their earnings.*

From the above, it is obvious that many young men that are interested and qualified to go to school get the opportunity without restriction but the young women, even if they are interested and qualified, are deliberately denied the opportunity. A reversal of this trend, therefore, typifies emancipation of women with regard to education. It could therefore, be upheld that women emancipation directly refers to gender mainstreaming which is the public policy concept of assessing the different implications for women and men in any planned policy action including legislation programmes in all areas and levels.

What is Transformation?

Transformation is the complete change of a prevailing situation or condition to a much more appreciable state. Social transformation, therefore, is the attempt to positively change people's behavior so that the desire of the society they inhabit can be realized. The idea in this paper is that if women are allowed to take part in decision making and are also accommodated in national planning, there would invariably be an increase in their quota contribution to the economy, and as a result, more progress would be made.

Synopsis of Oal Rotimi's *Our Husband Has Gone Mad Again*

Theplay*, Our Husband Has Gone Mad Again,* written nearly four decades ago, is the story of Lejoka-Brown, a retired-but-still-agile army Major who takes to politics, on his exit from the military, an action that is fast becoming a tradition in present day Nigeria. His reason for dabbling into politics is not strange at all,as we see below.

Lejoka Brown: Politics is the thing now in Nigeria… you want to be favoured? Politics. You want to chop life? No, no – you want to chop a big slice of the National cake? Na politics.

He thus, pitches tent with the National Liberation Party and as a greenhorn in the domain of politics, with no political guile, he relies on his well – known military tactics, of "surprise and attack".

In order to secure the people's votes especially those of the women folks, he strategizes accordingly, marrying another wife, Sikira, (wife of necessity) mainly because her mother is the president of the Market Women's Association. Being a son-in-law to such an influential personality, the president will surely use her influence to get him the women's votes. The secret plan of Di Major though, was to use her achieve the ambition of becoming the Minister for Housing after which he would settle her with a huge sum to start trading and encourage him to look for another husband. Mama Rashida would remain in the father's house while he would relocate to the Ministers' Quarters where Liza would join her from abroad to live together happily ever after, without knowing that he had anything to do with any other woman at all.

His problems actually begin when Liza, the wife he married while fighting in the Congo, decides to join him unexpectedly in Nigeria after the completion of her medical training in America. She arrives to meet not only Sikira but also another wife, Mama Rashida.

Actually, two days before the court marriage to Liza, which is now six years old, he had received a telegram from his father, intimating him of the proxy marriage of his late elder brother's wife Mama Rashida, to him as tradition demands. Even if he would have thought of telling Liza, the situation did not permit it. The marriage was just two days away and she was preparing to travel to America on a Kenyan scholarship to study medicine. It would surely have spelt disaster for whatever plans that were concluded.

The combination of an elder wife, (married two days before Liza's own marriage) the tranquil Mama Rashida, a feisty and up front, Sikira and the Catholic faithful, westernized, cigarette-smoking Liza, Rtd Major RahmanTeslimLejoka-Brown is no longer at ease!

The farcical trappings in the plot begin to manifest as we witness an attempt by the husband to keep the wives apart in order to sustain a lie earlier to that Mama Rashida and Sikirawere his sister and niece respectively. Their identities are inevitably revealed and we notice an unexpected alliance between all three woman against the man.

Matters only get worse in the second half of the play when Liza starts to gradually indoctrinate her co-wives with 'strange ideas' about gender parity and modern ideas of marriage, which combine to weaken Lejoka-Brown's domestic authority.

From this point, altercations become a recurring theme in Lejoka-Brown's household, especially between the due of Sikira and Liza against their husband. With a continual desire to exert his authority over his wives, there is frustration arising from the stubborn determination for self emancipation from matrimonial slavery and high-handedness on the part of the women. A verbal altercation degenerates into a fight and while Liza and husband chase each other around the house, Sikira is obviously fed up with the ugly situation, "Sikira rushes in from the rear of house; on her head is a large trunk box. She hastens across the living room, kicks door open and bolts out, almost bumping into ManaRashida.

Mama Rashida: A-ah! What's happening? Sikira!
Sikira: I'm going home to my mother
Mama Rashida: Wait! Answer me… what's the matter?
Sikira (leaving): *Our husband has gone mad again!*

In the end, the women break out of their cocoons of isolation in the 'slave camp' of Major Lejoka-Brown. Sikira replaces the husband in the political arena, with the mother's influence. Mama Rashida is advised by Alhaji Mustapha to relocate to the village, AbuleOja, where there is spacious land that would accelerate development of her chicken business and Liza would have made good her threat of travelling back abroad, leaving Lejoka-Brown a longer but he is wise enough to come to terms with the new order and according to him, "women are taking over the world".

Exhortation In*Our Husband Has Gone Mad Again*

Diyanni (2000) is of the opinion that "plays may be vehicles of persuasion" citing the examples of Henrik Ibsen and Benard Shaw, Diyanni argues that drama, is used to dramatize ideas and issues, which means that drama can help to transform society. OyinAdejobi, as cited in Jeyifo (1985), in corroboration of the above idea, writes that:

> *… There was a time when government asked the people to give their names to enumerators for a census. Many people misunderstood the purpose of the exercise and thought giving one's name to an enumerator opened one to tax harassment and so, many people refused to cooperate. Well, we told them that we would create a play on to enlighten the people about it and those who watched the play on television, agreed that the production was helpful.*

If drama performs a persuasive function, if invariably means that it also plays an exhortative function; that is playwrights could employ the genre to "try hard to persuade someone to do something", as the dictionary puts it. Thus, the main thrust of this paper is to bring to the fore, how Ola Rotimi uses the Play,*Our Husband Has Gone Mad Again,*to persuade the women folks to wake up and work assiduously to emancipate themselves from matrimonial and societal restrictions and gender inequities and to ultimately anchor the struggle on a framework of feminism which Chukwuma (1994) describes as:

> *A rejection of inferiority and a striving for recognition. It seeks to give the woman a sense of self as a worthy, effectual and contributing human bein*g.

Though, we do not behold a manifestation of these traits,ab-initio in the play, they become very conspicuous as the plot deepens. The arrival of the elite wife of the protagonist marks the beginning of the inculcation of new ideas into the youngest wife, through a deliberate subtle indoctrination.

> As typical of the local Nigerian house wife, Sikira does ot genuflect but kneels to greet her husband as tradition directs. To show the uniqueness in this humility and submission to the husband, she even refers to him as "my lord", but this value is disregarded as she gradually begins to experience a new orientation. Liza's influence starts to grip Sikira with the introduction of a new style of dressing to Sikira; a tight micro-mini snippet. She seems to suddenly realize her feminine providential

endowments which were merely rusting away in isolation. In a genuinely appreciative tone, she confides in Liza:

Sirika: You are a strong woman, with a strong, strong heart. Sometimes, I wish I, too had your kind of strong, strong heart, so I could tell our husband go to hell.

Liza: *(Condemns this wish as insolent:)* no woman should say that to her husband when he has not done any wrong.

Liza is able to earn the women's respect because she sees them as fellow women who are vulnerable to the antics of the men. If Lejoka-Brown could lie to her that he had no other woman when indeed he had two others, then what could he not do to beguile the quasi-literate two. She, therefore, emparthizes with them. One the part of Mama Rashida, Liza gives her a new orientation about how to run her egg and chicken business. They then realize that she is not the snub they earlier thought she was. Liza actually created room for this impression when we hear her remark, upon the discovery that Sikira is a co-wife.

Liza: I cannot and will never surrender myself to bee devoured in this blatantly decadent third rate domestic circus! Nor will I ever condescend to sharing the same monster of a husband with that snotty ill-bred foul-mouthed, uncouth, angry grossly, ribald, Whippersnapper of a chipmunk!

Liza: your shouting will only succeed in attracting curious spectators from the outside, Mr.Lejoka-Brown!

Lejoka-Brown: I don't care

Liza: well I do! I hate washing my dirty underwear in public!

Lejoka-Brown: My dear woman, I'm not an underwear!

Liza: Don't obscure the issue please. It is quite apparent that a breach of faith has been flagrantly committed by you…

Lejoka-Brown: (Gruffly) as an African, I have a right to marry as many wives as I can handle.

Liza: Under native law and custom-true but our marriage was performed in court, Mr.Lejoka Brown! Inthe Congo. Under the French law: one man, one woman, so… don't you go around kidding yourself, fellow!

This argument continues to linger and Mr. Brown gets into a raving mood, but on realizing that Liza is not yielding, but stubbornly refusing to succumb to masculine intimidation, he mellows down, saying:

Lejoka-Brown: Let's sit down like two real human beings and I'll explain.

However, this is not intended to encourage women to engage in unnecessary argument with their husbands but to encourage them to stand their grounds when they know they are right. As we see in the case of this couple, the husband, seeing that the wife is standing on the part of truth, has no choice but to defer to her. The situation further shows that dialogue is better, an idea Lejoka-Brown defers to when he tells Liza that:

"two bulls can't drink from the same bucket at the same time, they will lock horns".

Liza, on her own, educates the women about couples having respect for each others' feelings. In her opinion:

Liza: I believe a woman must try to be a loving, loyal wife and all that. One the other hand, the husband must try to show some respect for the wife. After all, when we boil it down, men and woman are all created equal….

As we see in the play, it is at this point that Sikira articulates the idea of forming a political party in the spirit of the new maxim "men and women are all created equal" This new idealism gives her confidence and a strong voice as we see in her reaction to the husband's threat of tearing her skimpy attire.

Sikira: Do as I say, do as I say! It's always do as I say. Always command, command! Why don't you show some respect and let me do as I want; just once!

In the end, all the women break out of their isolation in the 'slave house' of Mr.Lejoka-Brown. Sikara becomes a politician, Mama Rashida goes to the Village to acquire a large piece of land where her chicken business continues but Liza remains. Individually, the women are now empowered; an assurance that there will be a boost in the economy.

Conclusion

It must be understood that economic, political and social developments are the benchmarks for assessing the wealth of nations. To experience this development, nations must reconsider the marginalization of women in every sector, which has long been identified as a bane of our progress because they have been denied the opportunity for equal participation in the affairs of state. Ogbiti (2009), citing Agboro (2005) writes that:

> *Sex stereotypes are a result of tradition and culture that created inequality of men and women as well as male domination of the society. Women constitute the majority of illiterates in Nigeria. At all levels of education, males represent higher ratio that females.*

From the foregoing, it is evident that, for a meaningful transformation to take place, women must start to participate equally in every stratum of the economy so that Nigeria can enjoy the advantage of being populous.

Recommendation

This paper recommends inter-alia:

1. That women must begin to reject their description as the "weaker sex" by showing that whatever a man can do, a woman can equally do and sometimes, even better. This is partly the idea conveyed in the action of Lejoka-Browns three wives.
2. Wikipedia tells us that the demographic figure of Nigeria in 2017 is 190,886,311 out of which 97,466,760 about 49.4% are females. If this figure of females is equally enabled in all ramifications, as their male counterparts just as Sikira and Mama Rashida become in *Our Husband Has Mad Again,* Nigeria would be better for it.
3. Every culture in Nigeria should begin to see education of females as paramount.
4. Women should also be modest in their struggle for emancipation. They must never misinterpret this as being at loggerheads with their husbands because their headship of the family is a Divine proclamation. This ideal is commendably demonstrated by Liza in *Our Husband Has Gone Mad Again.*
5. The idea that men and women are created equal by God and that no one should claim superiority over the other, should be inculcated in children right from elementary school, so that the males, especially, will grow with the reality that the female is not in any inferior.

Reference

Bello Imam (1995) *Ethnographic Survey of South-Ibie Clan*. Ibadan: Vintage Publishers Ltd.

Chukwuma, C. (1994) *Feminism in African Literature*. Enugu: New Generation Books.

Jeyifo, B. (1985). The Truthful Lie; *Essays in a Sociology of African Drama*. London: New Beacon Books Limited.

Ogbiti, C. A. (2009) "Gender Equity: "A Panacea for Enhancing Women's Contribution for Sustainable National Development". *In a Journal of Arts Management Science and Technology (JAMST) Vol. 1* No.ETF Project.

Rotimi, O. (1977)*Our Husband has Gone Man Again*. Ibadan: University Press Plc.

COOLING EFFECTS OF R12, R134A AND R290/R600A

BY

ZUBAIR, A.M.
DEPARTMENT OF MECHANICAL ENGINEERING, AUCHI POLYTECHNIC, AUCHI, EDO STATE, NIGERIA
E-mail: mustaphazabair5@gmail.com

D.O. ARIYO
DEPARTMENT OF MECHANICAL ENGINEERING, FEDERAL POLYTECHNIC, OFFA, NIGERIA
Emil: davidoariyo1@gmail.com

Abstract

Cooling coefficients were determined for a refrigeration cycle operating between temperature limits of -25^{0}C (evaporator temperature) and 42^{0}C (condenser temperature). The refrigerants used in the refrigerator cycle were R12, R134a and R290/R600a. The cycle was originally designed for R12 with compressor capacity of 125W, degree of sub-cooling of 9K and degree of superheating of 15K. R134a and a binary mixture of R290/R600a (50% each by mass) are considered as suitable alternatives for ozone depleting R12 because of their similar thermodynamic properties such as pressure and temperature. Therefore, the refrigeration cycle designed for R12 was retrofitted with R134a and R290/R600a using the same compressor capacity and parameters such as refrigerating capacity, mass flow rate, compression work, condenser capacity and Coefficient Of Performance (COP) were computed. The flow rate of R12 is the highest which is indicative of its low evaporative specific heat. Condenser capacity of R134a is the highest with the corresponding highest COP of 3.01. Suction and discharge pressures of the three refrigerants are fairly close. The analysis showed that cooling effects of the three refrigerants are close enough for R134a and R290/R600a to be used as substitutes in existing refrigeration systems.
Keywords: Refrigeration Cycle, R12, R134a, R290/R600a, Cooling Coefficients.

Introduction

Chlorofluorocarbon (CFC) refrigerants such as R11, R12, R114 and R115 have been used extensively in the refrigeration and air-conditioning industry. These refrigerants have chlorine as one of the constituents, therefore they are ozone depleting substances with significant ozone depletion potentials. Ozone depletion potential (ODP) of a substance is a measure of its ability, compared with R11 (with highest ODP of 1), to destroy stratospheric ozone. These refrigerants, apart from their high ozone depleting potentials, also contribute to global warming and are therefore greenhouse gases. The global warming potential (GWP) of a greenhouse gas is an index describing its ability, compared with CO_2 (which has a very long atmospheric lifespan), to trap radiant energy. The GWP is connected to a particular time scale such as 50, 100 or 500 years but for regulatory purposes, the convention is to use the 100-year integrated time horizon (ITH) (ASHRAE, 2014).

Environmentally friendly refrigerants must therefore possess the following characteristics:

1. Low or Zero ODP
2. Good System Efficiency
3. Low GWP

The Montreal protocol which governs the elimination of ozone–depleting substances was strengthened at the London meeting in 1990 and confirmed at the Copenhagen meeting in 1992. In accordance with this international agreement, production of CFCs in developed countries was totally phased out on January 1, 1996. Production in developing countries was phased out on January 1, 2010 (UNDP and Ariyo 2008).

Hydrofluorocarbon, (HFC) refrigerants contain no chlorine atom, therefore their ODP is zero. Refrigerant 134a of the fluorothane series is used as a direct replacement for R12, although service procedure has to be followed to retrofit existing R12 systems to R134a. For example mineral oils used as lubricants in R12 systems are not compatible with R134a. Instead relatively hygroscopic polylester oils are used in R134a compressors (ASHRAE, 2013).

Hydrocarbons such as propane (R290), n-butane (R600), Isobutane (R600a) and R290/R600a (50% each by mass) are being used as refrigerants. They have zero ODP and low GWP, however they are highly inflammable which may constitute an obstacle to their widespread use as refrigerants especially for commercial and industrial applications. In household refrigeration and air-conditioning systems, quantities of hydrocarbon refrigerants that will be charged are very small compared with quantities of R12 charge for the same systems. Hydrocarbon refrigerants are compatible with mineral oils used in R12 systems (UNDP and Ariyo 2008).

Analysis

Choice of Operating Temperatures

To ensure effective heat transfer, design parameters are as follows: The refrigerator is designed for ambient (room) temperature of 32^{o}C and refrigerated space temperature of -15^{o}C. R134a and a binary mixture of R290/R600a (50% each by mass) are considered as suitable alternatives to R12. Some old household refrigerating systems still run on R12, but if leak occurs, these systems are expected to be retrofitted to R134a or R290/R600a. For domestic refrigeration systems running on R12, subcooling of liquid refrigerant by 9k corresponds to 15K superheat of refrigerant vapour (Prasad, 2005; Arora, 2004; Dossat, 2004) hence these values were used in the analysis.

In order to achieve reasonable heat transfer rate, a temperature difference of 5 to 10^{o}C is expected to be maintained between the refrigerant and the medium (Nag, 2005). Figure 1 shows selection of operating temperatures. In this paper, a temperature difference of 10^{o}C was maintained for evaporator and condenser.

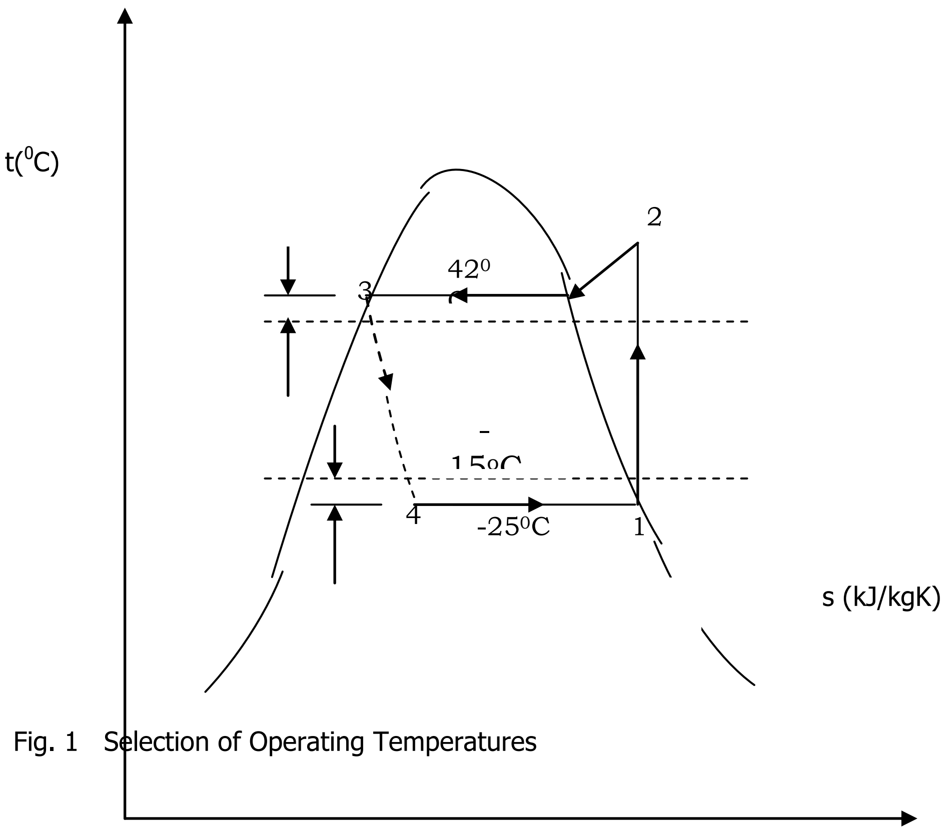


Fig. 1 Selection of Operating Temperatures

Respectively, for example if the space is to be maintained at -15^{o}C, the refrigerant will evaporate at -25^{o}C. In operation, the space temperature is maintained at -15^{o}C and all the sensible heat coming into the space is transferred to the refrigerant and converted to latent heat of evaporation of the refrigerant. This conversion takes place at -25^{o}C. With this temperature, corresponding saturation pressures of the three refrigerants are above atmospheric pressure so as to prevent ingress of air into the refrigeration system.

Room temperature of 32^{o}C was chosen after several measurements in the four warmest months of the year (February, March, April, and May) (Ariyo, 1997). With this temperature, and temperature difference of 10^{o}C, condenser temperature is 42^{o}C. Having selected condenser temperature of 42^{o}C, evaporator temperature of -25^{o}C, degree of subcooling of 9K and degree of superheating of 15K, analysis of refrigeration cycles for R12, R134a and R290/R600a was carried out based on the t-s and p-h diagrams in Figures 2 and 3.

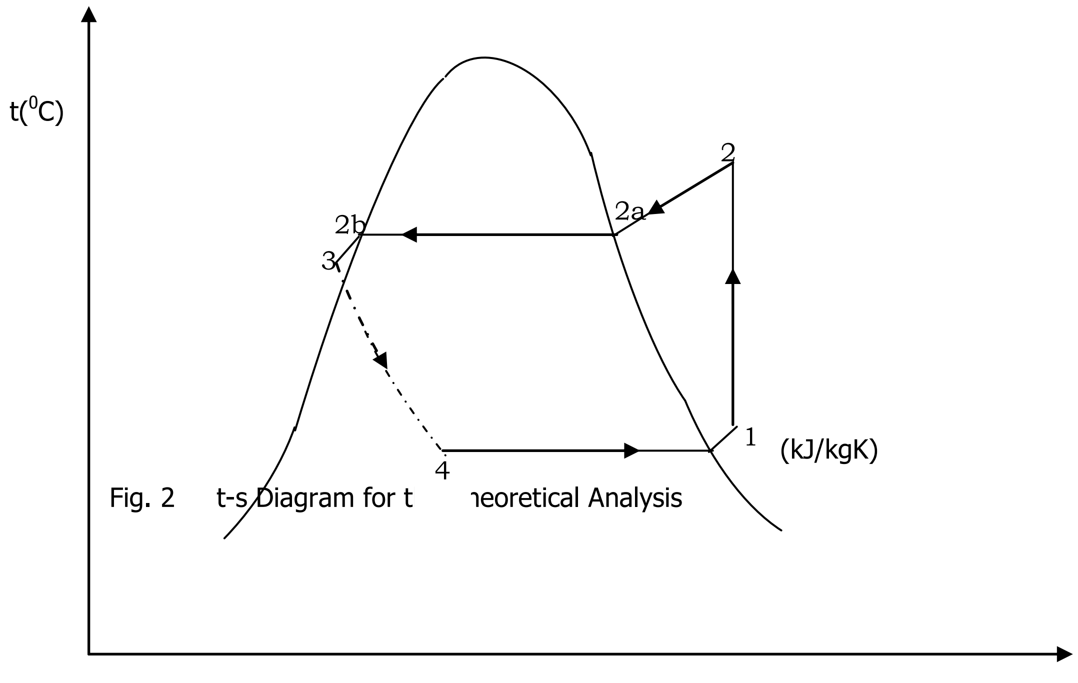


Fig. 2 t-s Diagram for t heoretical Analysis

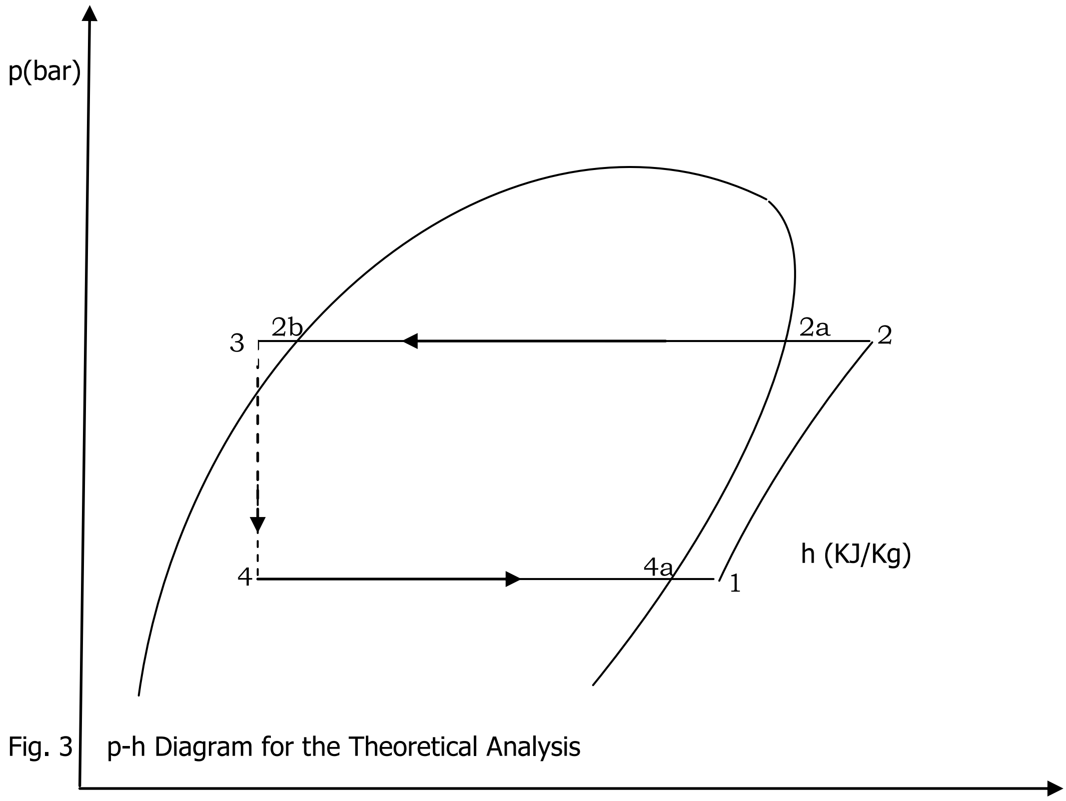


Fig. 3   p-h Diagram for the Theoretical Analysis

Results

From first law of thermodynamic, steady flow energy equation (SFEE) is stated thus: Q_{1-2} - W_{1-2} = $(h_2 - h_1) + C_2^2 - C_1^2 + g\,(Z_2 - Z_1)$

(kJ/kg)   (1)

2

(Nag, 2005)

where

Q_{1-2} = heat transfer

W_{1-2} = work transfer

C_1, C_2 = velocity at states 1 and 2

Z_1, Z_2 = elevations at states 1 and 2

g = acceleration due to gravity.

For the four major refrigeration system components (compressor, condenser, throttle valve, evaporator) the kinetic energy term $(C_2^2 - C_1^2)/2$ and potential energy term g N (Z_1, Z_2) are small compared with other terms in the equation therefore they are neglected. The equation reduces to

$$Q - W = \Delta h \qquad (2)$$

Equation (2) was applied to each component of the refrigeration system to arrive at the following equations that could also be derived from the p-h chart.

1. Compressor

$- W_{1-2} = h_2 - h_1$ (3)

2. Condenser

$- Q_{2-3} = h_2 - h_3$ (4)

3. Throttle Valve

$h_3 = h_4$ (5)

4. Evaporator

$Q_{4-1} = h_1 - h_4$ (6)

Coefficient of Performance, COP = Refrigerating effect /Compression work (kJ/kg)

Mass flow rate, $\dot{m}$ = Refrigerating capacity/ Refrigerating effect (kg/s)

Refrigerant tables were used to pick enthalpy values for the computations. The results of the analysis are shown in Table1. Ozone depletion potentials are global warming potentials of the three refrigerants are shown in Table2.

Table 1 Performance Data of R12, R134a and R290/R600a

Refrigerant	Operating Temperature (^0C)	Corresponding Operating Pressure (bar)	Degree of Subcooling (K)	Degree of Superheating (K)	Compressor Capacity (W)
R12	Evaporator -25	1.2370	9	15	125
	Condenser 42	10.1002			
R134a	Evaporator -25	1.0685	9	15	125
	Condenser 42	10.7230			
R290/R600a	Evaporator -25	1.4005	9	15	125
	Condenser 42	10.5740			

Refrigerant	Compression Work (kJ/kg)	Refriger-ating or Cooling Capacity (W)	Mass flow rate (kg/s)	Coefficient Of Performance (COP)	Refrigerat-ing Effect (kJ/kg)	Condenser Capacity (W)	Refrigerating Efficiency(%) $COP_{actual}/COP_{Carnot}$
R12	40.08	367.24	0.00311845	2.94	117.76	492.24	79.46
R134a	51.96	376.41	0.00240560	3.01	156.47	501.41	81.35
R290/R600a	99.67	338.11	0.00125411	2.71	269.63	463.11	73.24

Table 2 Ozone Depletion Potentials and Global Warming Potentials of the Refrigerants (ASHRAE, Refrigeration, 2006)

Refrigerant	Compatible Lubricant	ODP	GWP_{100}	Flammable
R12	Mineral Oil (MO)	1	10600	No
R134a	**Polyolester (POE)**	**0**	**1300**	**No**
R290/R600a 50% /50% (by mass)	Mineral Oil (MO)	0	3	Yes

Discussion of Results

The refrigeration system was originally designed to run on R12 but later retrofitted to R134a and R290/R600a respectively and the performance with each of these refrigerants was compared with R12 to validate their suitability as substitutes for R12.

At the operating temperatures considered, COP of R134a is better than other two refrigerants with R290/R600a having the least COP. According to the results, mass flow rate of R12 is the highest because evaporation specific heat of R12 is the lowest. High flow rate of refrigerant increases compression work (W) and consequently compressor uses more energy. This fact could have been demonstrated if compressor capacity was not fixed for the refrigerants. Although compressor size was fixed at 125W for the three refrigerants, refrigerating capacities for the refrigerants are different with R134a having the highest COP of 3.01. The amount of heat removed (W) from the condenser by air for R134a is the highest and this also established its best cooling effect.

The refrigerating capacities of the three refrigerants with the same compressor capacity of 125W are fairly close. Refrigerating capacity of R134a is higher than that of R12 by 9.17W while refrigerating capacity of R290/ R600a is 29.13W less than that of R12. Similarly COP of R134a is higher than that of R12 while COP of R290/600a is lower than that of R12. Mineral oils used in R12 compressors are compatible with R290/ R600a which makes it a good drop in substitute for R12. The major change that is expected to be made to convert R12 systems to R134a is that of changing mineral oil in the compressor to polyolester oil.

Table 2 shows ozone depletion potentials and global warning potentials of the three refrigerants. Ozone depletion potentials and global warning potentials of R134a and R290/ R600a are lower than ODP and GWP of R12, although R290/R600a is more environmentally friendly because of its very low GWP.

Conclusions

Nigeria has hydrocarbon gases in abundance and this could favour the use of hydrocarbon refrigerants in refrigeration and air-conditioning equipment. Service procedure needs to be developed for safety because hydrocarbon refrigerants are highly inflammable.

From the results of this analysis, performance data of R134a and R290/R600a are good enough for the refrigerants to be considered as substitutes for R12, therefore they are recommended as alternative refrigerants to R12 in existing household refrigeration and air-conditioning equipment and also in the manufacturing of new equipment.

References

UNDP, Ariyo, D.O. (2008). Manual for refrigeration and air conditioning practitioners. United Nation Development Programme.

Ariyo, D.O. (1997). Models for Ambient Dry bulb Temperature are Relative Humidity Statistics related to

Building Cooling Loads for Ilorin and Ikeja. M. Eng. Project Report, Department of Mechanical Engineering, University of Ilorin.

Arora, C.P. (2004). Refrigeration and Air-conditioning. 2nd Edition. Tata McGraw-Hill Publishing Company Limited, New Delhi.

ASHRAE (2014). Handbook of Refrigeration. S.I. Edition, American Society of Heating, Refrigerating and Air-Conditioning, Engineers, Atlanta, G.A.

ASHRAE (2013). "Handbook of Fundamentals", S.I. Edition, American Society of Heating, Refrigerating and Air-Conditioning. Engineers, Atlanta, G.A.

Dossat, R.J. (2004). Principles of Refrigeration.. 4th Edition. Pearson Education (Singapore) Pte. Ltd, Indian Branch, Patparganj, Delhi.

Nag, P.K, (2005). Engineering Thermodynamics. 3rd Edition. Tata McGraw-Hill Publishing Company Limited, New Delhi.

Prasad, M. (2005). Refrigeration and Air-Conditioning. 2nd Edition. New Age International (P) Limited, New Delhi.