CLIMATE SMART AGRICULTURE, FOOD SECURITY AND SUSTAINABLE DEVELOPMENT

GLOBAL ISSUES & LOCAL PERSPECTIVES volume One

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Preface

This book adopts an exegetical approach as well as a pedagogic model, making it attractive agriculture and environmental economics teachers, professional practitioners and scholars. It is eschews pedantry and lays bars the issues in such clarity that conduces to learning. The book elaborates on contemporaneous **Climate Smart Agriculture, Food Security and Sustainable Development** issues of global significance and at the same time, is mindful of local or national perspectives making it appealing both to international and national interests. The book explores the ways in which climate smart agriculture (CSA) food security, Sustainable Development issues are and should be presented to increase the public's stock of knowledge, increase awareness about burning issues and empower the scholars and public to engage in the participatory dialogue climate smart agriculture, food security, and sustainable development necessary in policy making process that will stimulate increase in food production and environmental sustainability.

Climate Smart Agriculture, Food Security and Sustainable Development: *Global Issues & Local Perspectives* is organized in three parts. Part One deals with The Concept of **Climate Smart Agriculture**, Part Two is concerned with The Concept of **Food Security And** and Part Three deals with the Concept of **Sustainable Development**

Eteyen Nyong; October 2025

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Chapter Twelve

Impact of Information Communication Technology(ICT) on Revenue Generation in Jalingo Local Government Area, Taraba State- Nigeria.

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1.1 INTRODUCTION

Revenue in form of taxation, excise duties, customs, licenses and fines are very crucial in ensuring smooth execution of government operations. Taxation is one of the leading source of revenue to government all over the world. It is noted that, developed countries have advanced and successful tax policies which enhance revenue collection.,On the other hand, developing countries often have inefficient tax systems which hamper their tax collection efforts (Kayaga, 2007). The increased budget deficits in developing countries reveal insignificant improvement in socio economic growth and development.

Technological innovation has been an important matter in tax and revenue collection. The advent of new instruments to help businesses work more efficiently affects the way taxes and revenues are collected. Information Technology (IT) seems to be more efficient in revenue collection and record keeping. Hence, the necessity to integrate former existing structures to more efficient new applications (Adams, 2002). In addition, the quantity of processing data increase each year due to expansion of the tax nets which requires a scalable infrastructure to keep the fiscal processes working (Maxwell, 2005). Reforms in Government's financial management systems and processes are becoming critical in response to increasing demands for greater transparency and accountability in the management of the public finances (Chiumya,2006). This is because Information Communication Technology provides counties with the opportunity to acquaint themselves with new strategies for effective l advocacy, design and implementation.. Furthermore, a computerized tax system may reduce the operational costs of revenue collections (Fisman & Gaht, 2002).

1.2 Statement of the problem

Inadequate revenue and increasing budget deficit have severely hindered governments in developing countries from executing infrastructural projects like electricity, roads, Medicare and others. These problems call for alternative source of revenue generation strategies to augment revenue shortfall. One major source of government revenue is tax. Unfortunately, tax revenues have been under-utilized due to problems involving generation and collection .Other

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problems are tax evasion and mismanagement of funds by governments at various levels in Nigeria (Dotun, 2012*)*.

Problems associated with taxation in Taraba State includes are inaccurate records and in-effective internal control system. Against this backdrop, this research seeks to examine the effects of information communication technology and information systems on internally generation revenue (IGR)in Jalingo Local Government area of Taraba State.

1.3 Objectives of the study

The main objective of the study is to examine the effect of Technology and Information Systems on revenue collection in Jalingo Local Government Council of Taraba State.

1.4 Research Hypothesis

The following hypotheses are stated to examine and test the degree of relationship between Information and Technology and internally generated revenue in Jalingo Local Government Council.

i. The Information and Technology does not have significant effect on internally generated revenue(IGR).
ii. The manual internally generated revenue does not have significant effect on total IGR in the study area.

2.0 Literature Review

Nightingale (2002) posited that the funds needed for governance in the public sector to finance government activities is referred to as revenue. He added that these funds can be generated from non-oil sources such as income and other forms of tax, royalties, fines, fees, rates and aids from the federal government and foreign financial institutions and countries.

Revenue is also described as the cumulative income accruable to an organization (public or private) from one period to another (Ipaye, 2009).

Taraba state government revenue comprises of receipts from taxation, sale of government properties, interests, returns from loans and investment earning. Bhatia (2006) opines that revenue receipts include “routine” and “earned” income. For these reasons, revenue does not include borrowings, recovery of loans and advances previously given to the third tier of government and other associated persons. Rather, it comprises of income taxes, vehicle haulages, Fines, aids, royalties, rates, fees among others.

Also, Otunbala (2011) postulated that government revenue includes the entire fund generated from oil and non-oil sources other than fund raised from issue of debt instrument such as government bonds, stocks, treasury certificates and treasury bills from capital and money market. He adds that the non-oil source includes; income tax receipts, charges, royalties, fees, utilities, miscellaneous revenues among others.

Stephen and Osagie (1985) opined that public revenue is concerned with the numerous ways in which government raises revenue. Osisami (1994) opined that revenue that accrues to State Governments in Nigeria is basically categorized into internally generated revenue and external which is collected from the distributable pool. Internally generated revenue are those revenues

generated within the state, which includes; taxes (pay as you earn, direct assessment, capital gain taxes, etc), motor vehicle licensing, royalties, among others.

2.1 Theoretical Review

The Technology Acceptance Model

This study adopted the Technology Acceptance Model also known as TAM. The model was developed by Davis in 1989. This is an information systems theory that models how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it. Perceived usefulness is the degree to which a person believes that using a particular system would enhance his or her job performance. Davis defined Perceived ease-of-use as the degree to which a person believes that using a particular system would be free from effort (Davis,1989).

Bagozzi, Davis & Warshaw (2007) argued that because new technologies such as personal computers,doubt and an element of uncertainty exists in the minds of decision makers with respect to the successful adoption of them, People form attitudes and intentions toward trying to learn the use of new technology prior to initiating efforts directed at using it .

2.2 Empirical Review

Samuel and Gabriel (2016) examined the effects of electronic internally generated revenue (e-IGR) on infrastructural development of Ebonyi State. The main objective of the study was to determine the degree of effectiveness of manual and electronic internally generated revenues and its impact on infrastructure using capital expenditure as proxy. Ex-post facto research design was adopted using secondary data. Data components of manual and electronic revenue and capital expenditure (infrastructure) of Ebonyi State government between 2011 and 2014 was collected and analyzed using regression and Pearson correlation method with the help of SPSS version 17.0. Results showed that the extent of relationship between each independent variable (IGR and e- IGR) were very low on the dependent variable which is Infrastructure development using capital expenditure, but cannot ignore the rate at which their degree changed, signifying an increase in association. Furthermore, findings from the study revealed that there exist no significant degree of relationship of variables studied. This implies that capital expenditure on infrastructure did not largely depend on electronic internally generated revenue in Ebonyi State within the years studied, rather on monthly statutory allocations which is largely from oil revenue. The study therefore suggests that the electronic approach to internally generated revenue be reviewed as a matter of urgency because of the dwindling oil revenue to the State.

Kimani (2017) carried out a study on the effect of technology and information systems on revenue collection by governments in Kenya. The study was guided by technology acceptance theory. The study also, employed a descriptive survey research design. The target population of the study comprised all county government employees. Purposive sampling and simple random sampling was used to select 102 respondents for the study. Content Validity was used as a validity test while Cronbach alpha coefficient was used for reliability test. Data was collected using self-administered semi-structured questionnaires. The results of the study revealed that

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technology and information systems had positive effect on revenue collection. The study recommended a revision of the County's Act and the integration of information systems in the County.

Adesoji, (2013), studied the effect of Internally Generated Revenue on infrastructural development of Lagos State. The research used purposive and survey sampling methods to sample respondents from the State Internal Revenue Board (SIRB). The data collection instrument used in the study was questionnaire whereas Descriptive (Simple Percentages) and Inferential (Spearman's Rank) statistical tool was also used to analyze data collected. Two hypotheses were formulated to ascertain the correlation between internal generated revenue and infrastructural development. The result obtained shows that there was a positive relationship between the dependent and independent variables. The study however suggested that; the revenue administration agencies need to be revived if additional and improved revenue is to be generated in the state.

Sani, (2013), studied Automated Internal Revenue Processing System in Taraba State using purposive sampling method to select respondents among the Staff of Taraba State Internal Revenue Board. Interviews, group discussion, direct observation and document study were instruments used for information and data collection for the study. A combination of Structured Systems Analysis and Design Methodology and Object Oriented Analysis Methodology was deployed to develop a feature rich software program called

Computerized Internally Generated Revenue Processing System. The application was developed using MySQL database platform as backend and Visual Basic 6.0 as front end. The implementation of the application resulted in the elimination of the identified problems and this has started to generate impact on the State infrastructural development.

3.0 METHODOLOGY

3.1 The study area

Jalingo is the capital of Taraba State in Nigeria. It is situated in the Savannah- Covered foothills of the Shebshi Mountains. Jalingo is located about 25 miles (40km) southeast of Benue River. The city serves as market road junction connecting major towns like Yola, Numan , Wukari and Bali. Jalingo lies roughly between latitudes 11^0 09' to $11^0$30 E. Jlingo became the capital of Taraba State when Taraba state was created in 1991 from the former Gongola State.

3.2 Population of the Study

In every research work, there must be basis on which research is to be carried out. Population is a well-defined or set of people, services, elements, and events, group of things or households that are being investigated. Considering the population of Jalingo Local Government Area employees which consists of 560 staff which serve as the basis of this research work.

Sampling Technique and Sample Size

The study adopted Slovin's formula to determine the sample size. The information was sought-from the sample employees on both quantifiable and non-quantifiable factors affecting income generation and Information technology of the Council.

3.3 Sources of data and Collection Instruments

The data for this study was generated from primary source. The study used primary data collected through general survey and administration of structured questionnaire.

3.4 Data Processing and Analysis

The qualitative data was analyzed using descriptive statistics tools which include the mean, mode, standard deviation and variance. The findings were presented in form of frequency tables and multiple linear regression model which was used to analyze the relationship between factors influencing effective revenue collection and optimal revenue in the Jalingo Local Governments in Jalingo area of Taraba State.

4.0 RESULTS AND DISCUSSION

A total of 85 questionnaires were administered to the sampled respondents. Out of this number, 84 were successfully filled and collected from the respondents. This translates to 95% response rate which is sufficient and acceptable for analysis.

The study also examined the demographic characteristics of the respondents in respect to gender, age, education level, length of service/work experience of revenue collectors in Jalingo Local government Council.

Table 4.1 shows gender composition of the employees in Jalingo local government. The findings reveal that the majority (39.5%) of the employees were female while 58.1% of the employees were male. This implies that revenue collection staff in Jalingo LG is female dominated which is in line with two third gender equality principle of the new Nigeria 2005.

The study sought to determine the age of the respondent. It was revealed that 13.7% of the respondents were aged between 25-35 years. It was also found that 38.4% of the respondents were between the age of 36-45 years while above 50 years were 11.6%.

The study sought to establish the length of service of the current employees.Findings of the study revealed that majority (64%) of the employees had served for a period of less than 10 years Again, it was established that employees with above 10 years were (12.8%). Furthermore, findings showed that over 50% of revenue collectors had experience of over 5years.

Further findings of the study revealed access to education result in increase in the stock of human capital, and in turn labor productivity, hence increase in IGR of the Council. The level of education of the respondents revealed that majority of them are educated. However, the level of education varied from primary, secondary, tertiary institutions and Post graduate degree. Thus, the number of years spent to acquire knowledge varies from 6 to 15 years. Policy that would ensure sustained and improved access to education in finance area will go a long way to increase

IGR in the study area. The results of this demographic factors analysis relatively concur with work of Adeyeye and Ajakaiye (2001). The Jalingo LG Government has not invested in training the collectors who rely on their work experience to collect revenue.

Table 4.2 shows descriptive findings and discussions relative to the study objective. The findings are presented means, standard deviations and variance. This study sought to assess the effect of technology and information systems on revenue collection by the Jalingo LGA ofTaraba State. The findings on Table 2 shows that respondents agreed (mean = 2.5: Std dev = 1.12) that the Jalingo LG Council had adequate tools for revenue collection. It was further agreed (mean = 2.1: Std dev =0.84) that the revenue collection tools were efficient.

The respondents disagreed that (mean= 0.72: std dev = 0.44) the staff were capable of using the ICT systems to collect and generate revenue reports. It was also agreed (mean = 3.87: Std dev = 1.14) the reports that were generated by the ICT system were verifiable and therefore ensured transparency and accountability. These findings implied that the use of technology was embraced thus ensuring efficiency and effectiveness in revenue collection. The revenue reports were generated in real time and could be used to know total revenue collected at a particular period. The finding implies a average improvement in revenue collection systems in Jalingo LGA. These findings are agree with those of Samuel and Gabreil (2016), who asserted that extent of relationship between each independent variable (IGR and e- IGR) were very low on the dependents in Ebonyi State.

Regression analysis was estimated to establish the effect of technology & information systems on IGR in JalingoLG Area. Coefficient of determination R^2 was used explains the extent to which changes in revenue collection can be explained by the changes in technology & information systems.

4.1 Model Specification

The explicit form of the equation is specified as;

$Y= F(X)$

$Y_1 = a_0+b_1x_1+b_2x_2+b_3x_3+u$

Where Y= Dependent variable (IGR Performance)

X_1X_2= Independent Variables (ICT Tool, Efficiency, Report, Record & Training of Staff)

The result of the estimated regression model is presented in Table 4.3. The coefficient of multiple determinations (R^2) with value 0.77 implies that four (04) regressors in the equation explain 77% of the systematic total variation in the IGR recorded is accounted for by all the explanatory variables in the regression model. This also implies that 77% of revenue collection in Jalingo LG can be accounted for by technology & information systems scores. The regression model is statistically significant (F value=77.05, probability level 0.000). The significance of the F-value implies that all the explanatory variable jointly exact significant influence on E-IGR in the study

area. The probability level 0.000 means that the chances are almost zero that the results of regression model are due to random events instead of a true relationship.

Thus, there is no doubt that there exists a significant linear relationship between IGR volume in Jalingo LG Council and the regressors used. All the four (04) explanatory variables used in the regression model were statistically significant at different percentage level except training of staff that statistically insignificant.

The coefficients 0.46 and 0.26 of efficient usage of ICT tools suggest that more addition efforts and tools is expected to result in 46 and 26% increase in the level of IGR of the area. The coefficient -0.211 of training of the staffs implies that a unit increase in the skill acquisition ICT will lead to 21% decrease in IGR generation expenditure. This scenario also poses a serious threat on the welfare and performance of staff members in the study area, especially among the lower cadre. However, the coefficient of report and record system 0.44 indicates that a unit increase in proper report and record will leads to 44% improvement on IGR of Jalingo LG Area.

5.0 Summary , Conclusion and Recommendation

From the findings of the study, investment in ICT is very important augment the revenue of Jalingo Local Government Area. From the analysis of the first hypothesis, the study found that t Jalingo LG Area had adequate tools for revenue collection. It was further agreed (mean = 2.1: Std dev =0.84) that the revenue collection tools were efficient. It was also agreed (mean = 3.87: Std dev = 1.14)that the reports generated by the ICT system were verifiable and therefore ensured transparency and accountability. These findings implied that the use of technology was embraced thus ensuring efficiency and effectiveness in revenue collection.

Secondly, in testing for the next research hypothesis, which is the extent of relationship between independent variable -electronic internally generated revenue (e-IGR) and ICT showed a very low relationship. There is no doubt that there exists a significant linear relationship between IGR volume in Jalingo LGA and the regressors used. All the four (04) explanatory variables used in the regression model were statistically significant at different percentage level except training of staff that was statistically insignificant.

The study also,examined the effect of Information and technology on electronic internally generated revenue in Jalingo LG area of Taraba State. In this study, the study used descriptive statistic and regression analysis to test the stated hypothesis using primary data.

Based on this finding, the study concludes that if electronic approach to revenue generation is maintained and reviewed frequently, it will boost internal revenue thereby creating more funds for government expenditures in Jalingo Local Government Area.

Table 4.1 Demographic Characteristics of the Respondents

Variables	Frequency	Percentage
Age		

50 above	10	11.6
31-49	33	38.4
23-30	29	13.7
18-24	12	14.0
Gender		
Female	34	58.1
Male	50	39.5
Duration in Services		
1 – 5	17	19.8
6 – 10	38	44.2
11above	18	20.7
Educational level of Respondents		
Primary	5	5.8
Secondary	43	50.6
OND/NCE	28	32.6
HND/BSc	8	9.3

Grade Level of Respondents		
34- 7	20	23.3
8-10	26	30.2
10- 14 above	30	34.9

Source: Field Survey, 2025

Table 4. 2: Effect of Technology and Information Systems on revenue collection by the Jalingo LGA, Taraba State

	N	MIN	MAX	MEAN	STD DF	VAR
	84	1	4	2.5	1.12	1.26

Does Jalingo LGA have necessary tools for revenue collectio n?						
Revenue collection tool are efficient?	84	1	4	2.1	0.84	0.71
Does revenue collection tools provide timely reports in the Council?	84	1	4	2.6	0.95	0.90
Are the staff being sent for training on ICT?	84	0	1		0.44	0.20

Source: Field Survey, 2025

Table 4.3: Result of Regression model

Predicators	Coefficient	Std Error	t-values	Probability
Constant	-0.911	0.25	-3.59	0.001
Efficiency of Staff	0.48	0.06	7.23	0.000
ICT Tools	0.26	0.42	6.20	0.000
Training of Staff	-0.21	0.11	-1.83	0.070
Report and Record	0.44	0.05	8.11	0.000
R – Square	0.77			
F – value	67.05			
DW Statistic	0.84			

Source: Field Survey, 2025

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