

## External Audit and Public Sector Performance: A Case of Selected Public Institutions in Rivers State



**Dr Davis Ojima**

Department of Economics Ignatius Ajuru University of Education, Port Harcourt, Nigeria

**ABSTRACT:** The study surveyed the effect of external audit and the performance of the public sector. Selected public institutions in Rivers State were used as case study. Concept of external audit, public sector management and public sector audit were reviewed. Relevant theories such as Agency, Inspired confidence and Policeman theories were examined in the study. The study also reviewed some empirical literatures. Correlation design was adopted in the methodology where data obtained were correlated. Further analysis of the data presented were reviewed and discussed. Findings of the study revealed amongst others that, institutions under study adheres to laid down procedures for good governance. Financial accountability were found to be effectively practiced in the management of public institutions in Rivers State which gave room for sustainable development. There is prompt attention to irregularities thereby reducing their occurrence in the agencies under study. It therefore, recommend sustainable financial transparency, integrity based appointment and adherence to the principle of audit independence and periodic capacity building for staff of Government Agencies to ensure that citizens enjoy the expected dividend of service.

**KEYWORDS:** External Audit, Public Sector performance, Public Entity, Accountability.

**JEL:** L32, M4, M48

### INTRODUCTION

The increasing need to satisfy the stakeholders and Public interest by Government agencies, drive the objectives for the public sector institution establishment and promote accountability, in order to shore up management confidence created the need for periodic reporting. Apart from this, there has been trust crisis in the management of Public institutions which has anchored reliance on third party opinion and approvals. The auditing of public institutions has become a routine in this regard as a way of restoring the confidence of the promoters of the public establishments, particularly the Government.

Public Sector is an economic system or entity whereby, its ownership and management rests with the government that establishes it and seeks to address the welfare need of the general public or tax payers. They are mainly set up to provide utility or essential services, no wonder they are often referred to public utilities. Public Sector deals with the promotion of social welfare services to the tax payers as their primary responsibility. The funding for the provision of such services are from the taxes collected by government. Therefore, tax payers are the major source of funding for Public Agencies. Agiobenebo, Onuchuku and Ajie (2000), will contend that public sector is a collection of government institutions found in a mixed economies to complement the working of the market mechanism. The fact that it is at the commanding heights of the economy and takes all major government budget, makes it imperative to pursue and ensure that there is proper, transparent, trusted evidence of their accountability. If the payment of taxes must be pursued, there is every need to provide to the payers and government evidence of proper spending and accountability. This obligation calls for public sector audit.

Hazaea et al. (2020) and Richard (2019) noted that public sector audits have become essential for public sector firms to prevent and detect financial and economic crimes perpetrated by public sector employees and politicians. These crimes impact the financial structures and performance of the company. Tapang and Ibiam (2019) assert that instances of bribery, misappropriation of public finances, and outright theft of government property have grown commonplace in public sector enterprises.

External Auditing is vital in dealing with reporting, expression of opinion and promoting accountability in the affairs of the public sector entity. Expression of opinion of a third party expert could restore the confidence of the government and tax

## **External Audit and Public Sector Performance: A Case of Selected Public Institutions in Rivers State**

payers whose welfare, the entities serves. Eke (2018), noted that external auditing involves reviewing evidences and audit trails to support accounting records for decision making.

Despite the place of public sector in the delivery of welfare services to tax payers, there appears to be a lacuna between the huge budgetary allocation, the internally generated revenue by government and the poor quality of services rendered by most of the entities. Additionally, there appears to be some level of inconsistency also between the external auditing exercise and the performance of the entities. This study will examine this lacuna and make appropriate recommendations. It will also consider the impact of external auditing on Public Sector Performance, financial transparency, effect of good governance in Agencies and Departments and to evaluate the challenges of external auditing in public institutions in Rivers State.

## **2. LITERATURE REVIEW**

### **Conceptual Clarifications**

#### **External Audit**

External audit refers to independent examination of a client's financial statements and records typically conducted by a professional accountant otherwise referred as external auditor who is to give an independent opinion about the financial statement of an entity. The primary purpose of an external audit is to provide an objective assessment of the financial position and performance of the entity, ensuring compliance with applicable laws, regulations, and accounting standards (Kumar & Sharma, 2018). External auditors evaluate the accuracy and completeness of financial statements, providing assurance to stakeholders such as investors, creditors, government agencies, and the general public that the financial information is reliable (Baker, 2015). In the public sector, external audits are particularly crucial as they enhance accountability and transparency in the management of public funds (Hyndman & Anderson, 2016). External audits play a vital role in promoting accountability within organizations. By providing an independent review of financial statements, external audits hold management accountable for every financial practices and decisions (Adebayo, 2017). This is particularly significant in the public sector where transparency is essential for maintaining public trust and confidence in government institutions. External audits help identify potential risks and weaknesses in financial reporting and internal controls. It also provide recommendations for improving financial processes and mitigating risks (Kober et al., 2010). This proactive approach not only strengthens financial management but also enhances the overall governance of the organization.

Trust is fundamental in any organization's relationship with its stakeholders. External audits demonstrates commitment to transparency and accountability, fostering confidence among stakeholders such as taxpayers, investors, and regulatory bodies (Groot et al., 2016). In the context of public sector management, this trust is critical for ensuring compliance with financial regulations and enhancing public service delivery.

The audit begins with planning, whereby the external auditor assesses the risks associated with the organization's financial statements. This involves understanding the entity's operations, internal controls, and previous audit findings to develop an appropriate audit strategy (Baker, 2015). In the fieldwork phase, auditors gather evidence through various methods, including examining financial records, interviewing staff, and conducting analytical procedures. This evidence is essential for forming an opinion on the accuracy of the financial statements (Kumar & Sharma, 2018). On completion of fieldwork, auditors prepare detail report that summarizes their findings and make recommendations which the management are expected to take proactive steps to address. The report is further submitted to the organization's management and governing body, and it is often made available to the public (Hyndman & Anderson, 2016). Many organizations, especially in the public sector seem to face budget constraints that limit their available resources for comprehensive audits. This can lead to incomplete audits and insufficient evaluation of financial practices (Adeyemi & Olatunji, 2016).

Political pressures can compromise the independence of external auditors, particularly in government institutions where audit findings may conflict with political interests (Mautz and Sharaf, 1961). This interference can result in compromised audit quality and integrity.

The effectiveness of external audits relies heavily on the auditors' expertise and training. Inadequate training can hinder the auditors' ability to identify financial irregularities or deficiencies (Olaoye and Owoeye, 2020).

#### **Public Sector Management**

Management of Public Sector refers the process of carrying out the managerial processes of organizing, coordinating, controlling, planning, and directing of the affairs of government owned entities. The goals and objectives of the entity cannot be satisfied without the deployment of these processes necessary for the effective and efficient running of the daily resources, programs, and services of that entity for the delivery of the mandates of that institution.

## External Audit and Public Sector Performance: A Case of Selected Public Institutions in Rivers State

Public Sector Management will have to contend with these responsibilities if they must serve the purpose for which they exist namely; prioritizes the public interest over private gain, ensure they are accountable to the people and adhere to extant rules and laws upon which they exist. Must see that such organisation or entity they serve and their activities are transparent in dealing with issues of management. Decision-making processes and actions are open to scrutiny at any point in time unhindered. Furthermore, public sector management must see that its services are designed to benefit the larger society free from discrimination.

### Public Sector Audit

Gekula and Isanzu (2020), would define public sector audit as the examination of the performance of the public sector in terms of its financial operations. Appah (2017), corroborates this to state that it comprises of examining the financial and non-financial records of the public sector organizations with a view to give opinion of its financial position at a given period of time. Public sector audit is carried out to certify the accuracy of financial records and that they are in keeping with extant rules and provisions.

### Types of audit

1. Internal audit: This refers to the systematic process through which employees of a corporation or government agency conduct objective and independent evaluations of an organization's financial status, operational procedures, and managerial practices. The primary objective is to provide an accurate assessment of performance while ensuring that the findings remain unaffected by internal biases, office politics, or other organizational influences. An effective approach to enhancing internal audits is the establishment of an audit trail, which consists of a chronological sequence of events, time- and date-stamped financial records, and documented operational decisions. Organizing data in this manner facilitates auditors in identifying patterns, retrieving specific information, and accurately tracing errors or discrepancies within the system (Oshisami, 2010).
2. External audit: This process involves an independent third-party evaluation of a company's financial statements to determine their accuracy and assess whether its accounting practices align with relevant regulations and standards. The auditor ensures that financial reports and records accurately reflect the company's financial position and overall performance. Publicly traded companies are required to publish financial statements to provide transparency for investors and shareholders, necessitating independent audits to verify the completeness and accuracy of these records. Similarly, private companies undergo external audits as part of standard financial practices, enabling them to file tax returns based on their verified net profit. Additionally, external audits contribute to building credibility with customers and serve as evidence of financial stability when seeking credit from lenders. These audits are conducted by external auditors who maintain no financial or professional ties to the organization. While the specific qualifications for external auditors may vary, they must be certified accountants with recognized professional accreditations (Zinyama, 2013). Public sector auditing extends across various levels of government—federal, state, and local—and encompasses a broad range of entities, including ministries, agencies, and public enterprises. The fundamental objective of the public sector is to advance the well-being of citizens by providing essential services such as healthcare, education, transportation, and public safety (Osborne & Gaebler, 1992).

### Theoretical Literature

This study is anchored on some theories which are examined below.

#### Agency Theory

This theory buttresses the relationship between a principal and an agent whereby, the person acting for the organisation is an agent and the person for which he acts is the principal. The theory considers the likely risks, conflicts of interest that could arise when the goal of the agent are inconsistent with that of the Principal. Jensen and Meckling (2000) define an agency relationship as a contract between one or more individuals, such as a principal and an agent, wherein the agent is entrusted to provide services on behalf of the principal, involving the delegation of certain decision-making authority to the agent. The evolution of agency theory is significantly influenced by the corporate governance literature, which examines the issue of the separation between ownership and control (Jensen et al., 2000). In the construction sector, an internal audit procedure is crucial for mitigating information asymmetry by empirically validating financial statements and addressing agency concerns. The principal-agent conflict is exemplified in agency theory, wherein the principal (owner) has insufficient grounds to trust their agents (managers) due to information asymmetries and conflicting incentives. Machlup (1967) asserts that in agency theory, agents possess superior information compared to principals, and this information asymmetry detrimentally impacts the principals' capacity to oversee whether their interests are well represented by the agents. The agency hypothesis posits that a firm's primary aim is to optimize shareholder wealth. The idea posits that the organization comprises principals, who possess the economic resources, and agents, who manage the principals' resources. A criticism of agency theory is its dependence on the presumption of self-interested agents striving to optimize their individual economic prosperity. The agency theory elucidates the rationale for the presence of external audits in organizations and can also clarify certain attributes of the internal audit department, including its size and the breadth

## **External Audit and Public Sector Performance: A Case of Selected Public Institutions in Rivers State**

of its functions, such as operational internal auditing compared to financial performance assessment within the organization. Agency theory posits that external auditing, akin to other intervention methods such as financial reporting and internal audits, facilitates cost-efficient contracting between owners and managers, hence enhancing financial performance within the firm through cost efficiency.

This theory establishes the fact that the Public entity is in agency capacity for the proprietor who at this point, the public being symbolising the government. It is important that public sector managers understands this relationship to be able to check whatever excesses they may be tempted to display.

### **Inspired Confidence Theory:**

This theory was developed JM Keynes in 1936. It was part of his 'General Theory of Employment, Interest rate and Money' which suggests that Government intervention in the economy can boost the economy. Therefore, the primary function of an audit is to enhance the credibility of the financial accounts of government institutions. The user's confidence is enhanced upon receiving confirmation from external auditors on the audited financial statements, as opposed to relying solely on the financial statements provided by management. The management use the audited financial statements to bolster stakeholder confidence in the organization's management and the reliability of the financial reports. The idea underscores the management's trust and credibility regarding the firm's audited financial statements, so ensuring stakeholders of the quality of management, the fairness of the financial report, and its reliability. Arising from this therefore, the professional service of the auditor becomes a selling point for the management. Essentially, the theory presents the external audit as evaluator of the credibility of an entity's financial statements.

### **Policeman Theory:**

This theory which was developed by David Hume, a Scottish philosopher, between 1739 and 1740 sees the auditor as a policeman whose duty is to enforce or command professional duty. The theory was to later develop and gained prominence in the 19<sup>th</sup> century through other economists. It ensures the prevention of crime, protect the investors or the proprietor, investigate actions and see that extant rules are complied with. As the police is also a detective, the police man theory sees the public sector auditor as one who should detect fraud and material errors in the financial statement of the organisation. The theory posits that management is responsible for establishing and sustaining a robust internal control system to mitigate fraud and other anomalies within the firm. Although auditors are not obligated to detect fraud unless specifically engaged to do so, a well-structured audit can reveal significant abnormalities within the organization. The theory aids the study in delivering reasonable certainty, accuracy, equity, and sufficiency of the financial statement.

### **Empirical Literature**

Rikzi et al (2024), studied the effect of transparency, governance and financial accountability in the public sector. The study adopted descriptive statistics to analyse the data obtained from the secondary sources. Findings revealed that the three elements of transparency, accountability and good governance significantly impact on public service entity and even the quality of financial reporting. It thus recommended that concerted effort should be made to instil discipline and transparency in the public institutions.

Aliya (2023) examined the correlation between audit quality and the transparency of financial reporting. The research examined the relationship between the factors influencing audit quality and financial reporting. This analysis additionally investigated the ramifications of this association using linear regression. The research indicates that audit quality is affected by variables including auditor tenure, audit firm size, auditor industry specialization, and audit fees. Financial reporting transparency was similarly found to be influenced by legislative frameworks, theoretical perspectives, and technology improvements. The findings reinforce the critical importance of audit quality in enhancing financial reporting and transparency, highlighting the significance of auditor independence, expertise, and ethical behavior. It also revealed the selected six (6) states to sample the annual budget of the respective states to obtain data for study. Rating method and graphs and were employed both for Data analysed and presentation which reveals that public financial accountability institution in Nigeria shows absence of proper professional practices and conduct leading to poor public service, accountability and sustainable growth. The study therefore recommended reforms of the public service to promote productivity and better performance.

Owolobi and Ogunode (2022) investigated public sector involvement and value-for-money auditing. The study employed content analysis. The study demonstrated that value for money audits can effectively reduce governance expenses, theft, and embezzlement of public monies. The study advised that the government reallocate limited public resources to priority sectors to restore public confidence in the management of public organizations. A culture of regular value-for-money audits in public institutions should be instituted to guarantee transparency and the appropriate use of public monies.

## External Audit and Public Sector Performance: A Case of Selected Public Institutions in Rivers State

Oloruntoba and Gbemigun (2019) examined accountability and public sector performance in Nigeria. The study utilized a cross-sectional research design including a population of 150 respondents from the Osi Local Government Area in Osun State, Nigeria. Out of 120 distributed questionnaires, 90 were completed and returned. The study employed a simple random sample procedure and analyzed the data acquired from the questionnaire using percentages and chi-square tests. Research indicates a correlation between the integrity of public officials and their performance. This implies also of the efficiency of external auditing and adherence to extant organisational rules.

### 3. RESEARCH METHODOLOGY

#### Research Design

Research design is the blueprint for the collection, measurement and analysis of data. It is a comprehensive outline that expresses how a study was conducted. This study adopted correlation survey research design. Appah (2020), will contend that it is a quantitative method where two variables of same group of participants have the relationship determined.

#### Area of the Study

The research area is Rivers State of Nigeria, created on May 27, 1967.

#### Sample and sampling technique.

The study employed a sample of four hundred (400) respondents from select public entities in Rivers State. The multistage sampling technique stratified and randomly selected ten of those institutions, namely; Rivers State University, Rivers State Television Authority, Rivers State Microfinance Agency, Rivers State Transport corporation, Rivers State Radio Broadcasting Service, Rivers State Waste Management Agency, Nigerian Tide, Rivers State Independent Electoral Commission, Rivers State Health Management Board, Rivers State Utilities Board, The study adopted Cochran formula to determine the sample size.

Cochran Formula:  $n = (Z^2 \times p \times (1-p)) / E^2$

Where:

n = Sample size

Z = Z-score corresponding to desired confidence level (e.g., 1.96 for 95% confidence)

p = Estimated proportion of the population (or prevalence)

E = Margin of error (or desired precision)

(1-p) = 1 minus the estimated proportion

This study applied 95% confidence level and a margin of error of 5%.

Z = 1.96 (95% confidence)

p = 0.5 (estimated proportion, 50%)

E = 0.05 (margin of error, 5%)

$n = (1.96^2 \times 0.5 \times (1-0.5)) / 0.05^2$

$n=384.16 \approx 400$ .

#### Method of Data Collection

Questionnaires were structured to allow respondents to select the responses they considered most appropriate. 400 sets were distributed to respondents consisting of Top management staff, senior Audit and Accounts staff of the entities selected in the study.

#### Validity of the Instrument and Data Analyses.

To clear ambiguity, research instrument was evaluated with corrections. The reliability of the instrument was determined through test and retest method correlated, employing the Pearson's Product Moment Correlation (r). The respondents show a good understanding of the research questionnaire. The study employed simple percentage and t-test. Percent and charts were used to answer the research questions while the t-test was used to test the hypotheses.

### 4. PRESENTATION AND ANALYSIS OF DATA

Table 4.1 Distribution and Retrieval of Questionnaire

Questionnaire	No. sent out	No. Returned	%
Distributed	400	379	98%

Source: Survey Research, 2025

## External Audit and Public Sector Performance: A Case of Selected Public Institutions in Rivers State

From the table above table, of the 400 (100%) questionnaire distributed only 379 (94.75%) were returned while 21 (5.25%) could not be retrieved.

**Table 4.1:1 Age of Respondents**

AGE	Frequency	Percent
15-25 Years	21	6
26-35 Years	48	13
36-45 Years	69	18
46-55 Years	178	46
56 Years and Above	63	17
<b>Total</b>	<b>379</b>	<b>100.0</b>

Source: Research's Computation, 2025

Table 4.1.1 shows age of the respondents, most of which were between 46-55 years and representing 178(46%) followed by 36-35 years representing 69 (18%), while 56 years and above representing 63 (17%). 26-35 years were 48 (13%) and 15-25 representing 21 (6%) .

**Table 4.2: Gender of Respondents**

Gender	No. of Respondents	Percentage of
Male	210	55%
Female	175	45%
Total	385	100

Source: Survey Research, 2025

Above table clearly show that 210 (55%) respondents were male while 175 (45%), female.

**Table 4.3: Education Qualification of Respondents**

EDUCATIONAL QUALIFICATION	Frequency	Percent
WASC	36	9.5
OND/NCE	88	23
HND/B.SC/B.ED	171	45
M.SC	53	14
Ph.D.	31	8.5
Others	-	-
<b>Total</b>	<b>379</b>	<b>100.0</b>

Source: Researcher's Computation, 2025

Table 4.3 indicate the educational qualifications of the respondents. It shows that most of the respondents had tertiary education and were 343 (90.5%) of the sample while 36 or (9.5%) had School Certificate.

**Research Question One:** What are the factors responsible for external audit in financial accountability of public institutions in Rivers State?

S/N	Items	Yes	%Yes	No	%No	Total
	<b>What are the factors responsible for external audit in financial accountability of Public entity in Rivers State?</b>					
1	To ensure a careful accounting procedure implementation.	290	77%	89	23%	100
2	To ensure all auditing principles meets global standard	271	72%	108	28%	100
3	To ensure resources are adequately allocated and used	312	82%	67	18%	100
4	To detect frauds and ensure resources are adequately allocated and used to mitigate irregularities in Public institution	363	94%	16	4%	100

## External Audit and Public Sector Performance: A Case of Selected Public Institutions in Rivers State

5	To indict and sack some workers	8	2%	371	98%	100
6	To ensure quality of audit practices and internal control.	346	91%	33	9%	100
7	To create jobs for external auditors	52	14%	327	86%	100

Source: Survey Research, 2025

Above table shows that in question one, 290 (77%) of the respondents agreed that external audit is carried out to ensure a careful accounting procedure implementation in the Public Agencies in Rivers State, while 89(23%) disagreed. In question two, 271 (72%) respondents agreed that it is to ensure all auditing principles meets global best practices. In question three, 312(82%) of the respondents agreed that institutional capacities is also a factor that impact external audit of public sector entities in Rivers State while 20 (20%) of respondents disagreed. In question four, 363 (94%) agreed that external audit detects fraud and irregularities, it also helps to ensure that resources are adequately allocated, while 16 (4%) of the respondents disagreed. In question five, 8 (2%) of the respondents agreed that it is to indict and sack worker while 371 (98%) of the respondents disagreed. Question six, 346 (91%) respondents agreed that external audit is to ensures quality of audit practices and internal control are put in check while 33 (9%) of the respondents disagreed.

Finally, in question seven, 52 (14%) of the respondents agreed that it create for external audit is to merely create job for the auditors. On the other hand, 327 (86%) respondents disagreed.

Analysis thus far shows that various factors are responsible for external audit investigation Public Institutions in Rivers State including issues of financial accountability.

**Research Question Two:** What are the effects of financial transparency in the management of the Public institution in Rivers State?

	<b>What are the effects of financial transparency in the management of the Public institutions in Rivers State?</b>	Yes	%Yes	No	%No	Total
8	Are audit reports made public?	278	73%	101	27%	100
9.	Do external audit reports identify and address irregularities?	250	66%	129	34%	100
10	Do financial report accurately reflect the financial position of the Public Institutions?	302	80%	77	20%	100
11	Are financial irregularities promptly addressed and resolved?	234	65%	135	35%	100
12	Are management and staff held accountable for financial decisions?	321	85%	50	15%	100
13	Has financial transparency improved accountability in your organization?	343	91%	36	9%	100
14	Has there been any significant improvement in financial management upon the implementation of financial transparency measures?	328	87%	51	13%	100

Source: Author Computation, 2025

We observed from the above questions and in eight that 278(73%) of the respondent that

Audit reports in Public institutions are made public, while 101(27%) disagreed. In the same manner, 250 (66%) respondents in question nine agreed that external audit reports identify and address irregularities in public organization. On the contrary, 129 (34%) disagreed. 302(80%) respondents agreed that financial report accurately reflect the financial position of the agencies in while 77 (20%) respondents to the contrary.

Again, 234 (65%) agreed that financial irregularities are promptly address and resolve in public agency while 135 (35%) of the respondents disagreed. In question twelve, 321 (85%) of the respondents agreed that management and staff are held accountable for financial decision. 50 (15%) of the respondents disagreed. In question thirteen, 343 (91%) agreed that financial transparency improves accountability of Public establishments, while 36 (9%) of the respondents disagreed. In question fourteen, 328(87%) of the respondents agreed that there has been significant improvement in the management of finances since implementing financial management system in the public agency in while 51 (13%) disagreed. Above analysis testifies the effect of financial transparency in the management of the public institutions in Rivers State?

## External Audit and Public Sector Performance: A Case of Selected Public Institutions in Rivers State

**Research Question Three:** what are the effects of good governance on financial accountability of public institutions in Rivers State?

	<b>What are the effects of good governance on financial accountability of public institutions in Rivers State?</b>	Yes	%Yes	No	%No	Total
15	Do you believe that good governance practices are implemented in your public institution?	338	89%	41	11%	100
16	Are there clear policies and procedures in place for financial management in your organization	353	93%	26	7%	100
17	Are external audit report made available to stakeholders?	297	78	82	22	100
18	Do you believe that external audit have improved financial accountability in your organization?	306	81%	73	19%	100
19	Do you believe that external audit have improved financial accountability in your organization?	288	76%	91	24%	100
20	Have external audits led to the identification and recovery of mismanaged funds?	356	94%	23	6%	100

Source: Survey Research, 2025

Our above table shows question 15, with 338 (89%) of the respondents agreed that good governance practices are being implemented in the Public institutions in Rivers State while 41 (11%) disagreed. Similarly, in question 16, 358(93%) of the respondents agreed that there are clear policies and procedures in place for financial management in the public organisations in Rivers State, while 26 (7%) disagreed. In question 17, 297(78%) respondents agreed that external audit report are often made available to stakeholders of the public organizations, while 72 (22%) of respondents disagreed. Again, in question 18, 306 (81%) agreed that external audit have improved financial accountability of the Agencies and Departments in Rivers State, while 73 (19%) of the respondents disagreed. Question 19 shows that, 288 (76%) of the respondents agreed that external auditing have improved financial accountability in Agencies and Departments, 91 (24%) of the respondents disagreed. In question 20, 356 (94%) of the respondents agreed that external audits led to the identification and recovery of mismanaged funds for Public entities while 23 (6%) of the respondents disagreed.

Above results indicates the effect of good governance on financial accountability of Government Institutions in Rivers State is efficient.

**Research Question Four:** What are the challenges of external audit of public sector management in Organizations in Rivers State?

	<b>What are the challenges of external audit of public sector management in Public Agencies in Rivers State?</b>	Yes	%Yes	No	%No	Total
21	Are funds to retain the services of external auditing firm available?	37	10%	342	90%	100
22	Is external auditing time consuming?	326	86%	53	14%	100
23	Are external auditing report are inaccurate?	304	81%	73	19%	100
24	Do government act or implement the external auditor's report?	333	88%	46	22%	100
25	Do External auditing firms lack adequate personnel?	314	83%	65	17%	100
26	Do external auditors usually get compromised?	362	96%	17	4%	100

Our analysis shows in Question 21 that, 37 (10%) of the respondents agreed that there are always funds to retain the services of external auditors for Public institutions, while 342(90%) disagreed. In the same vein, in question 22, 326 (86%) respondents agreed that external auditing is time consuming. On the contrary, 53 (34%) disagreed.



## External Audit and Public Sector Performance: A Case of Selected Public Institutions in Rivers State

Question 23 shows that, 304 (81%) agreed that external auditing report of Agencies are mostly inaccurate, on the contrary, 73 (19%) disagreed. In question 24, 333 (88%) of the respondents agreed that government does not implement external auditor's report, while 42 (22%) of the respondents disagreed. Similarly, in question 25, 314 (83%) respondents agreed that external auditors lack adequate personnel to do their job effectively, while 65 (17%) disagreed.

In question 26, 362(96%) respondents agreed that external auditors are often compromised, while 17 (4%) respondents disagreed.

Our result shows that external auditors are faced with certain challenges.

**Table 4.4: T-test Result on the factor responsible for external audit in financial accountability of Parastatals in Rivers State**

Paired Samples Test					
	Std. Error		P-		
	Mean	SD	Mean	t-test	Value
Factor responsible for external audit in financial accountability of Public Agencies in Rivers State	0.0701	0.6371	0.0221	2.363	0.016
	5	6			

Source: Researcher's Computation, 2025

### Interpretation

From the t-value of 2.363 with a probability value of 0.016 shows that since the probability value is less than 0.05, the hypothesis is statistically significant at 5 percent level. Hence, the study therefore rejects the null hypothesis which states that there is no significant factor responsible for external audit in financial accountability of Public entities in Rivers State, however, we accept the alternative hypothesis. This means that there are factors responsible for external audit in financial accountability of Public Agencies and they includes, to ensuring a careful accounting procedure, ensure auditing principles meet global best practices, ensure allocation of resources and quality of audit practices and internal control. Our results are in tandem with the views of Irabor (2023), Omigie (2023) and Mohammed (2015), which found a significant relationship between external audit, financial accountability and accounting procedure. The studies also revealed that audit is carried out in line with international best practices to ensure that resources are adequately allocated and utilized for public benefit.

**Table 4.2.2: T-test Result on the effect of financial transparency in the management of the Public Organizations in Rivers State.**

Paired Samples Test					
	Std. Error		P-		
	Mean	SD	Mean	t-test	Value
The effect of financial transparency in management of the Public Organizations in Rivers State.	0.3141	0.5321	0.03112	6.756	0.021
	4	6			

Source: Researcher's Computation 2024

### Interpretation

The result of hypothesis two shows a t-value of 6.756 with a probability value of 0.021. Since the probability value is less than 0.05, it suggests that hypothesis two is statistically significant at 5 percent level. Hence, the study therefore rejects the null

## External Audit and Public Sector Performance: A Case of Selected Public Institutions in Rivers State

hypothesis which states that there is no effect of financial transparency on financial accountability through external audit of Public Institutions but accepted the alternative hypothesis. Meaning that there is a significant effect of financial transparency in the management of the Public entities in Rivers State such as: making audit report public, financial report accurately reflect the financial position of the Public Institutions, management and staff were held accountable for decision, significant improvement in financial management since implementing financial transparency measures, etc. The result agrees with the works of Agbatogun (2019), Abdullah (2014) and Ozuoba (2020), Darwis (2022), which found a significant relationship on the effect of financial transparency in the management of the Public Institutions such as: making audit report public, financial report accurately reflect the financial position of the Public Entities, management and staff were held accountable for decision, significant improvement in financial management since implementing financial transparency measures, etc.

**Table 4.2.3: T-test Result on good governance and financial accountability of Public Organizations in Rivers State.**

Paired Samples Test					
	Std. Error		P-		
	Mean	SD	Mean	t-test	Value
Good governance and financial accountability of Public Organisation in Rivers State.	0.2041	0.6832	0.05102	10.01	0.022
	3	5		6	

Source: Researcher's Computation, 2025

The result of hypothesis three shows a t-value of 10.01 with a probability value of 0.022. Since the probability value is not more than 0.05, it suggests that hypothesis three is statistically significant at 5 percent level. Hence, the study therefore rejects the null hypothesis which states that there is no significant relationship between good governance and financial accountability of Public institutions but accept the alternative hypothesis. Meaning that there is a positive relationship between good governance and financial accountability of Public Institutions, such as the believe that good governance practices are implemented in the Public Organizations, a clear policy and procedure in place for financial management, external audit report are made available to stakeholders. External audit have improved the financial accountability. This result agrees with the works of Salawu and Adebayo (2019), Otniel (2020), Ritzi (2024) whose findings agrees that good governance are implemented in Public Institutions, a clear policy and procedure in place for financial management. External audit report are made available to stakeholders, external audit have improved financial accountability in the parastatals, etc.

**Table 4.2.4: T-test Result on the Challenge facing external auditors of parastatals in Rivers State.**

Paired Samples Test					
	Std. Error		P-		
	Mean	SD	Mean	t-test	Value
Challenge facing external auditors of parastatals in Rivers State.	0.421	0.8624	0.08221	12.05	0.004
	5	6			

Source: Researcher's Computation, 2025

### Interpretation

The result of hypothesis three shows a t-value of 12.05 with a probability value of 0.004. Since the probability value is not more than 0.05, it implies that hypothesis four is statistically significant at 5 percent level. Hence, the study therefore rejects the null hypothesis which states that there is no Challenge facing external auditors of parastatals in Rivers State but accept the alternative

## **External Audit and Public Sector Performance: A Case of Selected Public Institutions in Rivers State**

hypothesis. Meaning that there are Challenges facing external auditors of parastatals in Rivers State which includes: lack of funds to retain the services of external auditing firm, external auditing is time consuming, inaccurate auditing reports, lack of personnel by auditing firms, external auditor are usually compromised, etc. The result agrees with the works of Okaro et al (2011), Oladepo (2016). The scholars found that there is lack of funds to retain the services of external auditing firm, external auditing is time consuming, inaccurate auditing reports, lack of personnel by auditing firms, external auditor are usually compromised, etc.

### **5. DISCUSSION OF FINDINGS**

The result equally reveals the ages of the respondents, it shows that most of the respondents are between 46-55 years representing 178(46%) followed by 36-35 years representing 69 (18%), the next 56 years and above representing 63 (17%). Again, 26-35 years is representing 48 (13%) while the least is 15-25 representing 21 (6%)

From the result, it is evident that 210 (55%) respondents representing the male while the remaining 175 (45%) respondents representing female formed the respondents from which valuable data for the study were collected and analyzed.

The educational qualification of the respondents were also discussed. It shows that most of the respondents attended tertiary school and holds either HND/B.SC/B.ED representing 171 (45%), followed by OND/NCE representing 88 (23%), then M.Sc representing 53 (14%),WASC representing 36 (9.5%) . Finally, Ph.D representing 13 (8.5%).

#### **Factors are responsible for external audit in financial accountability of Public Organizations in Rivers State.**

290 (77%) of the respondents agreed that it is to ensure a careful accounting procedure of Government Institutions in Rivers State while 89(23%) disagreed. Similarly, 271 (72%) respondents of the study population agreed that it is to ensure all auditing principles meets global standard in Public Entities. 312(82%) respondents agreed that institutional capacities are also the factor that impact external audit of public sector entities in Rivers State while 20 (20%) of respondents disagreed. Again, 363 (94%) agreed that it detects and ensure resources are adequately allocated in Public entities in Rivers State, while 16 (4%) of the respondents disagreed. 8 (2%) of the respondents agreed that it is to indict and sack worker while 371 (98%) of the respondents disagreed. 346 (91%) of the respondents agreed that it ensures quality of audit practices and internal control of Public organizations while, 33 (9%) of the respondents disagree.

Finally, 52 (14%) of the respondents agreed that it create for job external auditors in Public Organizations in Rivers state while 327 (86%) respondents disagreed.

The hypothesis tested rejected the null hypothesis and accepted the alternative hypothesis which implies that various factors are responsible for external audit in financial accountability of Public Organizations. The result agrees with the works of Irabor (2023), Omigie (2023) and Mohammed (2015), which showed a significant relationship.

#### **The effects of financial transparency on financial accountability of Public Entities in Rivers State.**

278 (73%) of the respondents agreed that audit reports are made public in Public sectors in Rivers State while 101(27%) disagreed. 250 (66%) respondents of the study population agreed that external audit reports identify and address irregularities in the Public sector in Rivers State while, 129 (34%) disagreed. 302(80%) respondents agreed that financial report accurately reflect the financial position of Public Institutions in Rivers State whereas, 77 (20%) of respondents disagreed.

Again, 234 (65%) agreed that financial irregularities are promptly address and resolve in Rivers State public organizations, while 135 (35%) of the respondents disagreed. 321 (85%) of the respondents agreed that management and staff are held accountable for financial decision while 50 (15%) of the respondents disagreed. 343 (91%) of the respondents agreed that financial transparency improves financial accountability of Public Organizations while, 36 (9%) of the respondents disagree. Conclusively, 328(87%) of the respondents agreed that there has been significant improvement in financial management since implementing financial management system in Government owned establishments in Rivers state while 51 (13%) respondents disagreed. The hypothesis tested rejected the null hypothesis and accepted the alternative hypothesis which implies that various factors are responsible for external audit in financial accountability of Government entities in Rivers State.The result agrees with the works of Agbatogun (2019), Abdullah (2014) and Ozuoba (2020), Darwis (2022), which found a significant relationship.

#### **The effect of good governance on financial accountability of public enterprises in Rivers State.**

338 (89%) of the respondents agreed that good governance practices are implemented in Rivers State Agencies while 41 (11%) disagreed. 358(93%) respondents of the study population agreed that there clear policies and procedures in place for financial management in Government entities in Rivers State while 26 (7%) disagreed. 297(78%) respondents agreed that external audit report made available to stakeholders of the agencies in Rivers State while 72 (22%) of respondents disagreed. 306 (81%) agreed that external audit have improved financial accountability of Government entities in Rivers State while 73 (19%) of the respondents disagreed. 288 (76%) of the respondents agreed that external auditing have improved financial accountability in

## External Audit and Public Sector Performance: A Case of Selected Public Institutions in Rivers State

Government Agencies, while 91 (24%) of the respondents disagreed. 356 (94%) of the respondents agreed that external audits led to the identification and recovery of mismanaged funds of parastatals in Rivers State while 23 (6%) of the respondents disagree. This result presented above shows the effect of good governance on financial accountability of public parastatals in Rivers State is efficient. This result agrees with the works of Salawu and Adebayo (2019), Otniel (2020), Ritzi (2024) which found a significant relationship. This result presented above shows that there is an effect of financial transparency on financial accountability of parastatals in Rivers State. The hypothesis tested rejected the null hypothesis and accepted the alternative hypothesis which implies that the effect of good governance on financial accountability of public parastatals in Rivers State is significant.

### External auditor's Challenges in public institutions.

37 (10%) of the respondents agreed that funds to retain the services of external auditing firm available for parastatals in Rivers State are available while 342(90%) disagreed. 326 (86%) respondents of the study population agreed that external auditing time consuming in parastatals in Rivers State while 53 (34%) disagreed. 326(86%) respondents agreed external auditing time consuming of the parastatals in Rivers State while 53 (14%) of respondents disagreed. 304 (81%) agreed that external auditing report are inaccurate in parastatals in Rivers State while 73 (19%) of the total respondents disagreed. 333 (88%) of the respondents agreed that government acts or implement external auditor's report while 42 (22%) of the respondents disagreed. Also, in question twenty five, 314 (83%) of the respondents agreed that external auditing firms lack adequate personnel while 65 (17%) of the respondents disagree.

Summarily, 362(96%) of the respondents agreed that external auditor's usually gets compromised in parastatals in Rivers state while 17 (4%) respondents disagreed.

The hypothesis tested rejected the null hypothesis and accepted the alternative hypothesis which implies that there are challenges faced by external auditor in parastatals in Rivers State which is significant. The result agrees with the works of Okaro et al (2011), Usman (2020), Oladepo (2016).

## SUMMARY, CONCLUSION AND RECOMMENDATIONS

The research examined the importance of external audits in public sector management: A study of selected public entities in Rivers State. Through a combination of quantitative and qualitative research methods, data was collected from a diverse group of respondents. The study engaged 400 respondents, whose demographic characteristics provided valuable insights into the profile of individuals involved in Agencies. Among these respondents, a majority were male (55%), while females constituted 45%. The result equally reveals the ages of the respondents, it shows that most of the respondents are between 46-55 years representing 178(46%) followed by 36-35 years representing 69 (18%), the next 56 years and above representing 63 (17%). Again, 26-35 years is representing 48 (13%) while the least is 15-25 representing 21 (6%) .

## SUMMARY OF FINDINGS

The study reveals that there are factors responsible for external audit in financial accountability of Government Agencies in Rivers State which includes; to ensure a careful accounting procedure, to ensure auditing principles meet global standard, to ensure that resources are adequately allocated and used, to ensure quality of audit practices and internal control, to avoid misappropriation of funds, etc. The result agrees with the works of Irabor (2023), Omigie (2023) and Mohammed (2015), which found a significant relationship in factors responsible for external audit in financial accountability of parastatals in Rivers State. The study reveals that there is a significant effect of financial transparency in the management of the Agencies such as: making audit report public, financial report accurately reflect the financial position of the Agencies, management and staff were held accountable for decisions, presence of significant improvements in the financial management since implementing financial transparency measures, etc. The result agrees with the works of Agbatogun (2019), Abdullah (2014) , Ozuoba (2020) and Darwis (2022), which found a significant relationship on the effect of financial transparency in the management of Government Agencies in Rivers State including making audit report public. Financial report accurately reflects the financial position of the agency's management and staff which will be held accountable for decision, significant improvement in financial management and implementing financial transparency measures, etc.

The study find that there is a significant relationship between good governance and financial accountability of government entities in Rivers State. It observed that significant government policies are implemented in the Agencies. Thus, clear policy and procedures are put in place for effective financial management. It also observed that external audit report are made available to stakeholders whereas, external audit have been found to improved financial accountability in public sector management, etc. This result agrees with the works of Salawu and Adebayo (2019), whose findings agrees that good governance practices are implemented in the public sector, thus putting in place clear policy and procedures for financial management.

## External Audit and Public Sector Performance: A Case of Selected Public Institutions in Rivers State

Findings of the research reveals that there are challenges facing external auditors of Agencies in Rivers State which includes; lack of funds to retain the services of external auditing firm, external auditing is time consuming, inaccurate auditing reports, lack of personnel by auditing firms, external auditor are usually compromised, etc. The result agrees with the works of Okaro et al (2011), Oladepo (2016). The scholars found that there is lack of funds to retain the services of external auditing firm, external auditing is time consuming, inaccurate auditing reports, lack of personnel by auditing firms, external auditor are usually compromised, etc.

### CONCLUSION.

The study revealed critical insights into the role of external audits in enhancing governance, accountability and financial management of parastatals in Rivers State. Our conclusion aims to contextualize the findings, drawing connections to existing literature and exploring their implications for public sector practices. Notable among this is the overwhelming positive perception of external audits among respondents. Significant majority of them acknowledged the benefits of external audits as improving financial reporting standards, accountability and resource management. It is clear that stakeholders within the public sector recognize the vital role audits play in enhancing the integrity of financial operations.

### RECOMMENDATIONS

1. Financial transparency in the management of the public entities should be viewed with great concern of Government to restore public confidence in the management of the institutions.
2. Appointment of managers of public institutions should be based on track record of performance and integrity to ensure better and qualitative service delivery.
3. External auditors of Public entities should be made to file directly the audit reports to the Public Accounts Committee of the State Assembly rather than the client's responsibility.
4. Entities should periodically send their employees for capacity trainings to imbibe industry-wide best practices.

### REFERENCES

- 1) Abdullah, R. B. (2014), *Redefining internal audit performance: Impact on corporate governance*. McGraw Hill Press.
- 2) Adebayo, A. (2017), *Corruption and Accountability in Nigeria: The Role of Auditors*. *Journal of Public Administration and Governance*, 7(3), 1-15.
- 3) Adeyemi, S. B., & Olatunji, O. (2016), *Challenges of Auditing in the Public Sector: A Case Study of Nigeria*. *International Journal of Business and Management*, 11(8), 207-215.
- 4) Agba, A. M., & Gbodiyan, E. T. (2019), *Role of External Auditors in Enhancing Accountability in Nigerian Public Sector*. *International Journal of Public Administration and Management Research*, 7(1), 1-14.
- 5) Agbatogun, T.O. (2019), *Financial Accountability, transparency and management of the Nigerian public sector*. *Accounting and Taxation Review*, 3(1), 104 – 117.
- 6) Agiobenebo, T.J, Onuchukwu, O. & Ajie, H.A. (2000), *Public Sector Economics: Theories, Issues and Applications*. 2<sup>nd</sup> Ed. KB&L Ltd. Port Harcourt.
- 7) Appah, E. & Zibaghafa, S. (2018). *Anatomy of public sector finance and accounting*, Vinson Publishers.
- 8) Appah, E. (2020), *Research methodology: Integration of principles, methods and techniques*, Vinson Publishers.
- 9) Appah.E. (2017), *Auditing and assurance services (2nd ed.)*, Periscope Media and Publishing House.
- 10) Baker, R. (2015). *Understanding the Role of External Audit in Public Sector Governance*. *International Journal of Public Sector Management*, 28(2), 106-121.
- 11) Bola, I. O., & Oloyede, A. (2019), *External Auditing and Its Impact on the Efficiency of Public Sector Financial Management in Nigeria*. *International Journal of Public Administration and Management Research*, 7(2), 31-45.
- 12) Desai, N. K., Gerard, G. J. & Tripathy, A. (2011). *Internal audit sourcing arrangements and reliance by external auditors*. *Auditing: A Journal of Practice & Theory*, 30(1), 149-171
- 13) Eke, G.O. (2018). *Internal audit and corporate governance effectiveness in universities in Rivers State*. *European Journal of Accounting, Auditing and Finance Research*, 6(4), 35 – 58.
- 14) *Financial Audit Manual (2015)*. Office of the Auditor General of Nepal, Babermahal, Kathmandu.
- 15) Gekula, J. & Isanzu, J. (2020). *The effects of external auditing on financial performance of public sector organization in Tanzania: A case of Ilala Municipal Council*. *International Journal of Research and Analytical Review*, 7(3), 478-491
- 16) Groot, T. L. C. M., Kranenburg, H., & de Lange, R. (2016). *The Role of External Audit in Public Sector Governance: A Review of the Literature*. *Public Money & Management*, 36(4), 257-264.

## External Audit and Public Sector Performance: A Case of Selected Public Institutions in Rivers State

- 17) Hayes, R., Dassen, R., Schilder, A. & Wallage, P. (2015). Principles of Auditing: An introduction to international standards in auditing (3rd ed.), Prentice Hall.
- 18) Hazaea, S.A., Tabash, M.I., Khtib, S.F.A., Zhu, J. & Al-Kuhali, A.A. (2020). The impact of external audit quality on financial performance of Yemeni commercial banks: An empirical investigation. *Journal of Asian Finance, Economics and Business*, 7(11), 867-875.
- 19) Hyndman, N. & Anderson, R. (2016). External Audit in the Public Sector: The Importance of the Audit Committee. *Financial Accountability & Management*, 32(2), 145-159.
- 20) Irabor, U.K & Omigie, O. S (2023). Corruption and public sector auditing: A review of related literature. *Gusau international journal of management and social sciences*. Vol.6 (2).
- 21) Izeotonmi, F.I & Adeparubi, O (2021). External audit quality and public sector management in Nigeria. *European journal of social sciences study*. 6(5).23-35
- 22) Jensen and Meckling (2000) *Theory of the Firm: Governance, Residual Claims and Organizational Forms*, Harvard University Press. USA
- 23) Kettl, D. F. (2000). The Global Revolution in Public Management: Driving Themes, Missing Links. *Journal of Policy Analysis and Management*, 19(2), 167-197.
- 24) Kumar, K. & Sharma, R. (2018). The Role of External Auditors in Public Sector Governance: Evidence from India. *International Journal of Public Sector Management*, 31(4), 516-532.
- 25) Machlup, F. (1967). "Theories of the Firm: Marginalist, Behavioural, Managerial." *American Economic Review* (March): 1-33
- 26) Mautz, R. K. & Sharaf, H. A. (1961), *The Philosophy of Auditing*. American Accounting Association.
- 27) Mihret, D.G., & Admassu, M. A. (2011), Reliance of external auditors on internal audit work: A corporate governance perspective. *International business research*, 4(2), 67-79.
- 28) Munro, L. & Stewart, J. (2010), External auditors' reliance on internal audit: the impact of sourcing arrangements and consulting activities. *Accounting & Finance*, 50(2), 371-387.
- 29) Odia, J.O. (2014), Performance auditing and public sector accountability in Nigeria: The roles of supreme audit institutions. *Asian Journal of Management Sciences and Education*, 3(2), 102 – 109
- 30) OECD. (2020), *Government at a Glance 2020*. OECD Publishing.
- 31) Okafor, C. A. & Agbim, K. C. (2019), The Impact of External Auditing on Financial Management in the Nigerian Public Sector. *International Journal of Public Administration and Management Research*, 7(3), 55-70.
- 32) Olaoye, O. J. & Owoeye, J. A. (2020), Public Sector Auditing in Nigeria: Issues and Challenges. *International Journal of Accounting Research*, 7(1), 1-12.
- 33) Oloruntoba, S.F. & Gbemigun, C.O. (2019), Accountability and public sector performance in the third world country: A case study of Nigeria. *International Journal of Trend in Scientific Research and Development*, 3(3), 218-225
- 34) Omigie, O.S & Osaranmwinda, S (2023), Nigeria public sector performance audit effectiveness: A theoretical approach. *Gusau Journal of business administration (GUJOBA)*. 2 (1).
- 35) Osborne, D. Gaebler, T. (1992). *Reinventing Government: How the Entrepreneurial Spirit is transforming the Public Sector*. Addison-Wesley.
- 36) Oshisami, K. (2010), *Government Accounting and Financial Control*, Spectrum Books Limited.
- 37) Owolabi, S. A & Ogunode, O. A (2022), Public sector engagement and value of money audit in Nigeria. *International journal of research publication*. Vol.1 No2.
- 38) Ozuoba, N.T. (2019), Performance audit and accountability of the public sector in Nigeria. *International Journal of Innovative Finance and Economic Research*, 7(2), 1-9
- 39) Rashid, C.A. (2018), Efficiency of financial ratios analysis for evaluating companies' liquidity. *International Journal of Social Sciences & Educational Studies*, 4(4), 110-122
- 40) Rashid, C.A. (2017), The Importance of Audit Procedure in Collecting Audit Evidence/Case of Kurdistan Region/Iraq. *International Journal of Social Sciences & Educational Studies*, 4(2), 15-30
- 41) Richard, K. (2019), External audit and profitability of banking institutions in Kenya: A case study of commercial banks in Kericho County, Kenya. *Scientific Research Journal*, VII (V), 46-61
- 42) Salawu, R. A. & Adebayo, A. (2019). External Audits as a Tool for Enhancing Public Sector Governance in Nigeria. *International Journal of Public Administration and Management Research*, 7(2), 15-30.
- 43) Stiglitz, J. E. & Walsh, C. E. (2002), *Principles of Microeconomics*. W.W. Norton & Company.

## External Audit and Public Sector Performance: A Case of Selected Public Institutions in Rivers State

- 44) Tapang, A.T. & Ibiam, O. (2019). External audit and financial performance of microfinance banks in Nigeria. *International Journal of Social Sciences and Management*, 5(4), 95-10
- 45) Ugwunta, D. O. & Onuoha, G. (2019), The Role of External Audits in Enhancing Governance in the Nigerian Public Sector. *International Journal of Public Administration and Management Research*, 7(4), 89-102.
- 46) Zinyama, T. (2013), Efficiency and effectiveness in public sector auditing: An evaluation of the comptroller and auditor general's performance in Zimbabwe from 1999 – 2012. *International Journal of Humanities and Social Sciences*, 3(7), 267 – 282.



There is an Open Access article, distributed under the term of the Creative Commons Attribution – Non Commercial 4.0 International (CC BY-NC 4.0) (<https://creativecommons.org/licenses/by-nc/4.0/>), which permits remixing, adapting and building upon the work for non-commercial use, provided the original work is properly cited.