



Governance, Policies, and Climate Change in the Circular Economy of Akwa Ibom State, Nigeria

Dr. Nathan Udoinyang*¹, Filima Nyimabari Master*²

¹Department of Economics, Iconic University, Sokoto State, Nigeria

Email: u.nathan@iconicuniversity.edu.ng

ORCID: <https://orcid.org/0009-0008-2457-3045>

²Department of Economics, Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt, Rivers State Nigeria.

Email: nyimabari@gmail.com

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Abstract

This paper aims to understand the intersection of governance, policy, climate change, and the circular economy in Akwa Ibom State, Nigeria. A mixed method research design was employed, and data was collected from 400 participants across 18 Local Government Areas (LGAs) from the three senatorial districts, including industrial and coastal LGAs of Eastern Obolo, Oron and Ikot Abasi. Descriptive statistics, chi-square, and multiple regression were used to analyse the quantitative data, and qualitative data were collected through key informant interviews with local government officials. The study identified that the quality of governance and the enforcement of policies are determinative to the adoption of circular economy practices such as recycling, the reduction of waste, and the sustainable use of resources. Still, the lack of institutional capacity and the absence of community involvement are persistent challenges, especially in the climate vulnerable coastal areas. Using ecological modernization, adaptive governance, and institutional theories, the study concluded that responsive, inclusive, and adaptive governance improves the local climate change mitigation and adaption governance outcomes. The study is an addition to climate governance literature, particularly at the subnational level, with a multi-LGA perspective, and highlights the need to incorporate climate adaptive development planning and circular economy in the climate intersecting development planning in Akwa Ibom State.

Keywords: Akwa Ibom, Climate change, Circular economy, Governance

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Corresponding author: u.nathan@iconicuniversity.edu.ng

1. Introduction

The recent rise in global temperatures and the increasing frequency of extreme weather events are clear indicators of the impact climate change is having on the world and how this result is affecting the world as a whole. This change is affecting the environment and world economies, and is resulting in a decline in societal wellbeing. The impacts of climate change are particularly evident in the developing world, especially in sub-Saharan Africa and Nigeria, where the economy is beginning to face challenges resulting from climate change and the recent impacts of flooding, coastal erosion, and pollution.

Akwa Ibom State sits at the intersection of climate change, the degradation of the environment, and the erosion of governance. This state is situated in the coastal Niger Delta region of Nigeria and is characterized by low-lying coastal geography, rapid urbanization, and a growing population. The state's dependence on extractive industries has led to disproportionate levels of climate vulnerability. Climate risks include coastal flooding, shoreline erosion, loss of mangroves, and mismanagement of solid waste. These challenges have been exacerbated by a linear production and consumption process, which is overly resource extractive, features poor disposal with little to no recycling, and is characterized by defunct waste management systems. Considerable recognition on the need for alternative development pathways to address climate change while fostering positive growth in the economy and protecting the environment has been noted. The circular economy is the most favourable and most developed option to address climate change while fostering positive growth in the economy and protecting the environment. The circular economy advocates for resource efficiency and the reduction, reuse, and recycling of materials. Furthermore, the circular economy advocates for the regeneration of systems, especially natural systems Geissdoerfer, et al. (2020). Circular business models directly contribute to climate change mitigation by lowering emissions and indirectly facilitating climate adaptation by improving the resilience of the system or systems. Circular economy approaches provide the OECD and UNEP with the basis for describing the circular economy as a key pathway for addressing the SDGs and the climate targets of countries (OECD, 2020; UNEP, 2021).

The success of circular economy initiatives varies greatly based on the governing policies that are put in place. Governance refers to the used institutions, rules, actors, and processes that

decide on and manage actions, accountability, and policies over the environment. Governance at the subnational level, where local authorities implement and translate national policies into actions that affect communities, is of particular importance. Environmental governance in Nigeria has been criticized for inadequate stakeholder involvement, poor enforcement, insufficient institutional capacity, and fragmentation in policymaking (Damilola, & Victoria, 2021; Amusan & Olutola, 2023). This weak environmental governance especially in the local government context is the reason why climate-responsive circular economy practices are not fully embraced. Due to their proximity to the people, Local Government Areas (LGAs) are key players in circular economy and climate action initiatives. They are tasked with waste management and local regulations on the environment, land-use planning. There is considerable variation between the LGAs in Akwa Ibom State in terms of institutional capability, environmental stress, economic activities, and the industry. Eastern Obolo, Oron and Ikot Abasi, for example, poses environmental concerns that include industrial waste, coastal erosion, and pollution, whereas inland areas contend with agricultural waste, urban encroachment, and deforestation. The available research is particularly lacking for studies on the circular economy, differentiated governance, policy effectiveness, and related disciplines across different LGAs in Akwa Ibom State.

This research analyses governance, policies, and climate change through the Circular economy lens, focusing on 18 LGAs across the three senatorial districts of Akwa Ibom State. For optimal balanced geographic distribution, six LGAs were selected from each district, Eastern Obolo, Oron and Ikot Abasi was specifically chosen for its industrial prominence and climate vulnerability. The study also employs a mixed-methods approach to assess the relationship between the governance quality and the policy structure, on the local adoption of circular economy practices and responses to climate change. These findings enhance subnational climate governance scholarship and offer supportive advocacy for Akwa Ibom State policymakers incorporating climate and development plans with circular economy elements.

1.1. Aim and Objectives of the Study

This study aims to investigate the intersections of policy and governance with climate change and the circular economy in Akwa Ibom State. To accomplish this, the research objectives include the following.

Governance, Policies, and Climate Change in the Circular Economy

1. Evaluate the awareness and adoption levels of circular economy practices in the targeted local government areas of Akwa Ibom State.
2. Assess the scope of state and local governance and policy frameworks pertaining to climate change and the circular economy.
3. Assess the scope of governance quality and climate-responsive circular economy.
4. Assess the frameworks of institutions, policies, and sociology of the circular economy.

1.2. Research Hypotheses

H0₁: Governance effectiveness has no significant influence on the adoption of circular economy practices in Akwa Ibom State.

H1₁: Governance effectiveness significantly influences the adoption of circular economy practices in Akwa Ibom State.

H0₂: Governance quality has no significant effect on climate change mitigation and adaptation outcomes through circular economy initiatives in Akwa Ibom State.

H1₂: Governance quality significantly affects climate change mitigation and adaptation outcomes through circular economy initiatives in Akwa Ibom State.

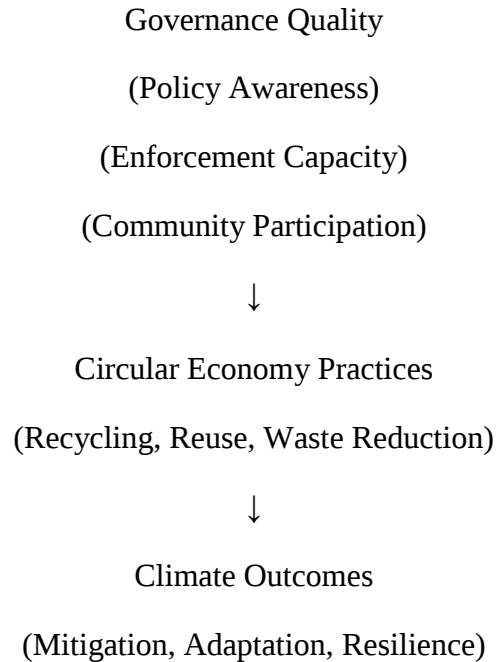
2. Theoretical Framework

The present study draws upon three main theories: Ecological Modernization Theory, Institutional Theory, and Adaptive Governance Theory. Ecological Modernization Theory posits that through technological advancements, policy reform, and institutional restructuring, environmental protection and economic growth can be pursued simultaneously (Mol, & Spaargaren, 2020). Within Akwa Ibom State, the theory helps explain how circular economy strategies (i.e., recycling, waste-to-energy, and sustainable industrial practices) can mitigate emissions while advancing economic activities.

In policy argumentation, Institutional Theory speaks to the impact of formal policies, their structures, and the organizational frameworks in place to achieve policy outcomes (Scott, 2021). Relative to institutional structures within a given LGA, circular economy activity can be variably explained by the institutional framework and the imbalance of policy enforcement, strength, and coherence. Within the parameters of climate change, Adaptive Governance Theory speaks to flexibility and the inclusion of stakeholders through learning processes and coordination at

different levels (Folke, et al. 2021). This theory is particularly applicable to climate change-vulnerable coastal LGAs, such as Eastern Obolo, Oron and IkotAbasi, where adaptive and participatory governance helps to strengthen adaptive capacity, and resilience is enhanced.

Figure 1. Conceptual Framework of Governance–Circular Economy–Climate Nexus



The three circles show the relationship of the three circles. The three components of governance are policy awareness, enforcement capacity, and community participation. These three empower the community adoption of circular practices. Through community participation, circular practices develop additional resilience to climate adaptation and the practice of climate mitigation. The circular practices also contribute to the practice of climate resilience and climate adaptation. This framework captures ecological modernization and adaptive governance principles emphasizing the role of institutions and governance.

2.1. Empirical Literature Review

Circular Economy and Climate Change: Conceptual Linkages

The circular economy (CE) has shifted from being resource-oriented to being a primary framework for climate change mitigation and sustainable development. Unlike the linear economy, with its 'take-make-dispose' model, CE emphasizes regenerative processes, waste

minimization, and the recycling of materials. Circular approaches and systems have been suggested to reduce, and in some cases, eliminate, greenhouse gas (GHG) emissions from the extraction of virgin materials and from improving industrial symbiosis. Other studies, including those of the UNEP (2021), also state that circular production models are a major means of reducing pollution and climate change.

Recent studies have pointed out that circular transitions are not only of a technological character but of an institutional one. For example, Kirchherr & Hekkert (2023) argue that the governance and regulatory framework quality in a given jurisdiction ultimately determines the speed and effectiveness of a given jurisdiction's CE transition. Particularly for climate-vulnerable regions, CE as a system could address both mitigation (through emissions reduction) and adaptation (through the establishment of resilient resource systems).

The interdisciplinary and cross-sectoral approaches to the CE pathways have been endorsed by the Intergovernmental panel on climate change (Creswell & Plano, 2021), who emphasizes the value of material circularity and efficiency as key supply-side and demand-side mitigation approaches. For example, the IPCC estimates that demand for CE strategies could yield an estimated 40% reduction in emissions across several targeted sectors. This reinforces the need for integrating CE into climate governance systems at all levels.

2.2. The Quality of Governance and the Impact of Governance on the Environment

Governance encompasses the systemic construction of institutions, management of risks and control, involvement of stakeholders, and the mechanisms of accountability that determine the state of the environment. One of the recent advocates of ecological modernization theory (EMT) is Mol and Spaargaren (2020), who states that with the right institutional changes and the market incentive structures, economic growth and environmental protection can occur simultaneously.

Across the developing world, the lack of institutional enforcement has been shown to hinder the effectiveness of the state that within national policies, waste recycling initiatives in Nigeria did not achieve their aims due to insufficient local government technical capacity (Adegbite, et al., 2022). In the Niger Delta climate governance is fragmented and underdeveloped at the subnational level (Amusan & Olutola, 2023).

This relationship is also examined by institutional theory. The regulatory, normative, and cognitive pillars give shape to the compliance behaviours (OECD, 2020). In many developing settings, impacts of weak regulatory enforcement and absence of normative pressures create an environment with little incentive for compliance.

2.3. The Need for Adaptive Governance and Climate Resilience

Adaptive governance theory is based on flexibility, stakeholder participation, and learning by doing in the management of the environment. Polycentric governance systems improve the climate and increase resilience in climate-sensitive areas (Folke, et al. 2021). Participatory waste management, and community based adaptive practices, help strengthen climate change adaptability in places like Oron, Ikot Abasi and Eastern Obolo. Adaptive governance fosters local integration in policymaking. This approach ultimately aids in lessening susceptibility to flooding, erosion, and pollution. Recent research in Africa shows that decentralized climate governance, coupled with greater fiscal and administrative autonomy, enhances environmental outcomes. Nonetheless, inadequate coordination among state and local actors remains a major obstacle.

2.4. Subnational Governance and Circular Economy Transitions

The majority of studies conducted on the international level highlight the importance of governance when attempting to connect circular economy frameworks with the mitigation of climate changes. Developing economies' success with Circular economy policies is dependent on the capacity for subnational governance (Kirchherr & Hekkert, 2023). Likewise, when attempting to reach climate goals, there needs to be coherence in policies and coordination in institutions when aligning circular economy transitions (Geissdoerfer, et al., 2020). With the right (strong) governance frameworks in place, Circular economy strategies would be able to reduce the world's emissions by 9% by 2050 (OECD, 2020).

The importance of subnational governments is growing in transitional sustainability. As reported, local authorities are crucial to converting national climate promises into actions. Stark contrasts persist in less developed economies (IPCC, 2022). Inadequate institutional capacity is one of the most significant challenges to climate risk management in Nigeria (UNDP, 2022; World Bank,

2023). Nigeria is also a case where enforcement, funding, and political will limit the adoption of the circular economy (CE).

The oil producing areas of Nigeria are most complex in terms of governance because of the environmental degradation that is present. Poor regulatory frameworks, overlaps in the systems, and political interference undermine the enforcement of a set of integration. Uncontrolled urbanization worsens the effects of climate change due to over consumption of resources and increased emissions (Ellen MacArthur Foundation, 2021). He recommends green urban infrastructure, sustainable urban transport, and a governance framework for climate resilient and adaptive urban areas.

2.5. Circular Economy in African and Nigerian Contexts

The African circular economy discussion continues to develop. Circular economy can aid in the diversification of the industry as well as the reduction of negative impacts on the environment (Udoinyang, 2025; UNECA, 2023). At the national level, studies in Nigeria highlight persistent governance challenges in environmental management. Initiatives for waste recycling are undermined by the weak capacity of local governments, even when there are supportive policies from the national level (Adegbite, et al., 2022). Climate policies are ineffective in the oil-producing states due to a combination of inadequate environmental legislation and weak enforcement (Damilola & Victoria, 2021). Another study noted that in the Niger Delta, there is little subnational climate governance, and in the order of community participation and transparency, these elements are lacking (Amusan & Olutola, 2023).

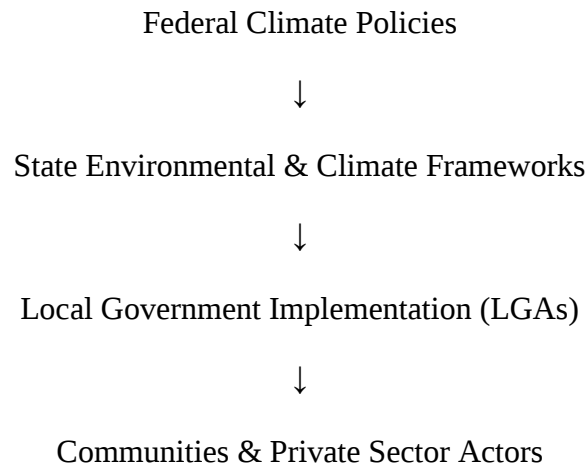
Studies in Nigeria have been largely concerned with the oil pollution problem and the management of oil pollution. However, studies do not cover integrated climate circular governance systems. Most studies examine the gaps in the implementation of a particular policy and fail to adopt a multi-LGA comparative method. Akwa Ibom State as a significant example due to its coastline, dependence on the extractive industry, and local governance varying quality. The combination of the (local) governance quality, the (local) enforcement of regulations, and the (local) implementation of CE are for the most part, still to be determined.

2.6. Research Gap and Study Contribution

Nigeria, at the subnational level, there is still little to no empirical research on the relationship between governance and climate responsive CE. Research in Akwa Ibom State is still developing. Most studies available to date are concerned with oil pollution, environmental degradation, and waste management. These studies have neither linked governance and circular economy to climate change, nor addressed the gap in literature. This study attempts to fill this gap by analysing multiple LGAs and combining governance, policy, and climate (within a circular economy).

Using the EMT, Institutional Theory and The Adaptive Governance Theory, the study attempts to provide a multi theoretical explanation for the varying degrees of CE and climate impacts. It attempts to contribute to the climate governance literature by providing empirical data from a subnational, coastal oil producing region of West Africa.

Figure 2. Multilevel Climate Governance Structure in Akwa Ibom State



The figure shows the governance hierarchy affecting the implementation of circular economy practices in the participating communities. Federal policies determine the national climate objectives, and state-level institutions apply these objectives to local governance. Local authorities implement these policies, and community members along with private sector participants act as implementers and beneficiaries. The figure shows coordination gaps and emphasizes the need for better climate governance in decentralized systems to enable vertical and horizontal integration.

3. Research Methodology

3.1. Research Design

In this study, the author used a mixed methods research design and adopted both quantitative and qualitative techniques to provide comprehensive and in-depth analyses of governance, policies, climate change, and the circular economy in Akwa State. The use of mixed methods is justified, especially in environmental governance studies, since the author is able to align and integrate qualitative insights from contextual governance and environmental institutions with quantitative measurement of governance (Creswell & Plano, 2021). For the quantitative study, the author focused on the perceptions and experiences of residents within the sampled LGAs, whereas the qualitative study involved key informant interviews with local government and environmental stakeholders in order to provide richer contextual backgrounds for the survey results.

3.2. Study Area and Population

The study area included 18 Local Government Areas (LGAs) divided amongst the three senatorial districts of Akwa Ibom State: Uyo, IkotEkpene, and Eket. This combination provided geographic diversity including representation of urban and rural areas plus environmentally and industrially varied LGAs such as IkotAbasi. The National Bureau of Statistics (2024) projected the total population of the chosen LGAs to be around 2.15 million people. The study population was restricted to adults (18 and older) who had resided in the LGAs for a minimum of five years in order to be sufficiently knowledgeable about the local governance and environmental problems of the area.

3.3. Sample Size and Sampling Technique

Applying Yamane (1967) sample size determination formula at a 95% confidence level, the sample size was determined to be 400 respondents. The study used stratified random sampling to distribute questionnaires proportionately to the 18 LGAs, then employed simple random sampling to choose respondents within each LGA. This method reduced bias in sampling and improved representation among the senatorial districts and various socio-economic categories.

3.4. Instrument for Data Collection

The primary data for this study was collected through a structured questionnaire divided into four sections, (A) socio-demographic characteristics, (B) awareness and practice of Circular economy initiatives, (C) governance and policy effectiveness, and (D) outcomes of climate change mitigation and adaptation. A Likert Scale was administered to obtain responses, (1) “strongly disagree” to (5) “strongly agree”. Additionally, semi-structured interview guides were administered for key informant interviews with a LGA selected officials and environmental officers.

3.5. Validity of the Instrument

The face and content validity was achieved through a pilot study conducted by the three scholars of environmental policy and development studies. The scholars provided constructive feedback for the clarification, relevance, Alignment, and objectives of the study. The validity for construct was also achieved through the adaptation of studies surveys on governance, circular economy and climate change (Geissdoerfer, 2020;Adegbite, et al., 2022). The instrument was tested for suitability on 40 respondents of non-sampled LGAs.

3.6. Instruments Reliability

The use of Cronbach’s alpha is a common method to assess the internal consistency of the questionnaire scales. The governance and policy scale recorded 0.82, circular economy practices scale 0.79, and climate change outcomes scale 0.84. Given the fact that these figures are above the threshold of 0.70, they can be considered to demonstrate the reliability and consistency of the measurement scale (Hair et al., 2021).

3.7. Data Collection

The distribution of questionnaires was done by research assistants who had been trained and understand the local settings of the LGAs. Both self-administered and interviewer-assisted methods were used to cater for the different levels of literacy of the respondents. This study involved human participants through questionnaire administration and key informant interviews. Ethical approval was obtained from the departmental research ethics committee of the authors’

affiliated institutions prior to data collection. Participation was voluntary, and informed consent was obtained from all respondents before participation. Respondents were assured of anonymity, confidentiality, and the right to withdraw from the study at any stage without penalty. All procedures complied with internationally accepted ethical standards for social science research involving human participants.

3.8. Data Analysis

Quantitative data was analysed using descriptive statistics, while the hypotheses were tested using chi-square and multiple regression analysis. The data collected through interviews in the qualitative phase were analysed using themes which were used to enhance and provide context for the data collected in the quantitative phase.

Table 1: Selected LGA's by Senatorial District

Senatorial District	Selected LGA's
Uyo District	Uyo, Itu, IbionoIbom, IbesikpoAsutan, NsitAtai, NsitUbium
IkotEkpene District	IkotEkpene, EssienUdim, ObotAkara, Ukanafun, Abak, OrukAnam
Eket District	Eket, Oron, EsitEket, Easter Obolo, MkpateEnin, IkotAbasi

Source: Authors fieldwork, 2026

This table shows how the 18 LGAs selected are spread across the three senatorial districts of AkwaIbom State, providing even distribution and representation, especially for IkotAbasi.

Table 2: Questionnaire Distribution Across Selected LGA's

Senatorial District	Local Government Area	Questionnaires Distributed	Questionnaires Returned	Response Rate (%)
Uyo District	Uyo	30	28	93.3
	Itu	22	21	95.5

Governance, Policies, and Climate Change in the Circular Economy

IkotEkpene District	IbionoIbom	22	20	90.9
	IbesikpoAsutan	22	21	95.5
	NsitAtai	22	20	90.9
	NsitUbium	22	21	95.5
	IkotEkpene	25	24	96.0
	EssienUdim	22	21	95.5
	ObotAkara	22	20	90.9
	Ukanafun	22	21	95.5
Eket District	Abak	22	21	95.5
	OrukAnam	22	20	90.9
	Eket	25	24	96.0
	Oron	22	21	95.5
	EsitEket	22	20	90.9
	Eastern Obolo	22	20	90.9
	MkpatEnin	22	21	95.5
	IkotAbasi	24	23	95.8

Source: Authors fieldwork, 2026

Table 2 shows how questionnaires were both distributed and collected in all 18 Local Government Areas in Akwa Ibom State. The allocation of the questionnaires was based on the population and the administrative rank of the LGA. Therefore, all 3 senatorial districts were represented. The recorded response rates of 90.9%-96.0% are perhaps a testament to exceptional coordination and/or to the respondents' familiarity with the topics of governance, climate change, and the circular economy. The data set's strength was also due to the selection of the LGA's, which included the urban areas of Uyo and Eket, as well as the environmentally sensitive, coastal

LGAs of Oron, Ikot Abasi and Eastern Obolo. The selection of all of the coastal LGA's provides the study with the ability to examine a wider range of ecological settings and diverse socioeconomic conditions.

Table 3: Demographic Characteristics of Respondent

Variable	Category	Frequency	Percentage
Sex	Male	220	55.0
	Female	180	45.0
Age	18-30	120	30.0
	31-45	170	42.5
	46+	110	27.5
Education	Secondary	140	35.0
	Tertiary	260	65.0
Occupation	Civil servant	110	27.5
	Trader/Artisan	150	37.5
	Farmer/Fisher	90	22.5
	Others	50	12.5

Source: Authors fieldwork, 2026

Table 3 shows that gender, age, education, and occupation were all represented in a relatively equal ratio. The respondents also predominantly held a tertiary qualification, which indicates that the participants were adequately equipped to address the issues associated with governance and the circular economy. The spread of respondents from diverse occupational backgrounds demonstrates the range of economic activities in the LGAs and is important for understanding the varied perceptions of climate change and the circular economy.

Table 4: Governance and Circular Economy Index

Indicator	Mean Score	Std. Dev.
Policy awareness	3.42	0.88
Enforcement capacity	2.91	0.95
Community participation	3.05	0.90
Circular economy adoption	3.18	0.84

Source: Authors fieldwork, 2026

Governance and Circular Economy Index

Table 4 illustrates how respondents perceive the indicators related to governance and the Circular economy. Among the three dimensions of governance, policy awareness exhibited a higher mean score whereas enforcement capacity scored the lowest. This uncovers a considerable gap in governance. Furthermore, the moderation of the scores in community participation and adoption of the circular economy indicates only a nascent, albeit under-developed practice in the LGAs, which justifies the call for enhanced institutional support.

Institutional and Sociological Framework Assessment

Findings revealed that institutional arrangements for circular economy implementation remain weak across most LGAs. Only 38.5% of respondents agreed that adequate institutional structures exist to support circular economy initiatives. Furthermore, 42.8% reported inadequate policy coordination among relevant government agencies. From a sociological perspective, respondents identified low environmental awareness, cultural resistance to waste sorting, and limited community engagement as major barriers to circular economy adoption. These findings suggest that strengthening institutional coordination and enhancing community participation are essential for effective circular economy governance in AkwaIbom State.

Figure 3. Governance Capacity Gap Model

- Policy awareness capacity (High)
- Community Participation (Moderate)
- Enforcement Capacity (Low)

The model in Figure 3 shows the imbalance found with the empirical data. Where policy awareness is high, enforcement capacity is low, and community participation is moderate. This imbalance is an example of the governance gap, an obstacle to the effective adoption of the circular economy. The figure illustrates the tenets of Institutional Theory. Policy gaps exist, but without enforcement and participation gaps, there is no policy.

Table 5: Regression Analysis of Governance and Circular Economy Adoption

Variable	Beta (β)	Std. Error	t-value	p-value
Governance Quality	0.46	0.079	5.82	0.000
Policy Enforcement	0.36	0.075	4.11	0.001
Constant	1.12	0.546	2.05	0.041

Source: Authors computation, 2026

Model Summary

$R^2 = 0.542$

Adjusted $R^2 = 0.537$

F-statistic = 116.42

F-significance = 0.000

Sample Size (N) = 400

Durbin-Watson = 1.87

The regression model explained approximately 54.2% of the variation in circular economy adoption, indicating good explanatory power. The overall model was statistically significant (F = 116.42, $p < 0.001$).

Figure 4. Regression Path Model

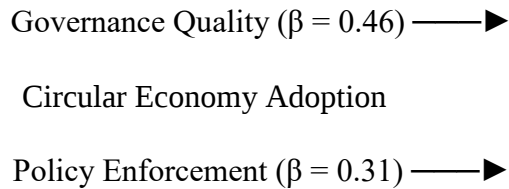


Figure 4 shows the regression results where governance quality and policy enforcement are predictors of the circular economy adoption. The impact of governance quality is the strongest ($\beta = 0.46$) and policy enforcement is slightly lower ($\beta = 0.31$). The model shows that policy enforcement, along with governance quality, increases the adoption of climate-responsive circular economy practices. This is in accordance with the theory of ecological modernization, where sustainable transition is advocated for.

Qualitative Findings from Key Informant Interviews

The qualitative component of this study involved twelve (12) key informant interviews conducted with Local Government officials, environmental officers, community leaders, and waste management stakeholders across selected LGAs in Akwa Ibom State. The thematic analysis revealed four major themes:

Theme 1: Weak Enforcement of Environmental Policies

Most participants acknowledged the existence of environmental regulations but emphasized weak implementation mechanisms.

"Environmental laws exist, but enforcement is inconsistent because local authorities often lack adequate manpower and logistics." (Environmental Officer, Oron LGA)

Theme 2: Limited Institutional Capacity

Respondents highlighted inadequate funding, technical expertise, and equipment as major barriers to effective climate governance and circular economy implementation.

"Many local councils are willing to implement environmental programmes, but financial and technical resources remain insufficient." (Local Government Administrator, IkotAbasi)

Theme 3: Low Community Participation

Several interviewees noted that residents are rarely involved during environmental policy formulation and implementation.

"People are expected to comply with environmental regulations, yet they are seldom consulted during policy development." (Community Leader, Eastern Obolo)

Theme 4: Growing Awareness of Circular Economy Opportunities

Despite institutional challenges, respondents recognized increasing public awareness of recycling, waste reuse, and sustainable resource management practices.

"Younger residents especially are beginning to understand the benefits of recycling and waste separation." (Environmental Officer, Uyo)

Overall, the qualitative findings complement the quantitative results by demonstrating that while awareness of circular economy practices is increasing, weak enforcement capacity, limited institutional support, and inadequate stakeholder participation continue to constrain implementation across the LGAs.

4. Discussion of Findings

In order to obtain robust and reliable regression estimates, a series of diagnostic and specification procedures were implemented. First, the dependent variable of circular economy adoption was measured as the composite index of the standard Likert-type scale items on the variables of recycling, waste reduction, reuse, and sustainable recycling resource practices. Independent variables, governance quality and policy enforcement, were also measured as factor analysis indices for the construction of governance quality and policy enforcement to reduce the measurement error. The absence of serious multi collinearity was ascertained via the variance inflation factor (VIF) and all of the estimates were below the threshold of 5. The absence of autocorrelation was verified by the Durbin-Watson (1.87) statistic. The normality of the residuals was captured by the histograms and the normal probability plots, while homoscedasticity was validated by the scatter plots of the residuals. Overall, these diagnostics suggest that the regression model is correctly specified and the estimates are valid for policy making.

The findings demonstrate that governance quality significantly influences the adoption of circular economy practices and climate adaptation outcomes in Akwa Ibom State. This result supports the arguments of Kirchherr and Hekkert (2023), who reported that institutional effectiveness remains a critical determinant of circular economy transitions. Similarly, Adegbite et al. (2022) found that weak local government capacity constrains environmental policy implementation in Nigeria.

The observed governance-capacity gap also aligns with Institutional Theory, which emphasizes the importance of formal regulatory structures in shaping organizational behaviour (Scott, 2021).

The relatively low enforcement capacity identified in this study suggests that awareness alone is insufficient for achieving environmental outcomes.

Furthermore, the qualitative findings corroborate adaptive governance theory (Folke et al., 2021), which emphasizes stakeholder participation, learning, and institutional flexibility as prerequisites for climate resilience. The limited community participation observed in this study may therefore undermine long-term sustainability outcomes unless inclusive governance approaches are strengthened.

Overall, the findings reinforce growing international evidence that successful climate-responsive circular economy transitions depend not only on technological innovations but also on strong institutions, policy coherence, stakeholder engagement, and effective environmental governance systems.

4.1. Conclusion

This study determined that the integration of climate change adaptation and mitigation circular economy strategies within the policy framework of Akwa Ibom State is dependent on the quality of most of the governance components and the enforcement of policies and regulations, as well as the involvement of the community, and therefore, it is crucial to improve the quality of the governance structures and the enforcement capacities at the sub-national level in Akwa Ibom State and the participating LGAs. Empirical studies on sub-national governance and enforcement capacities need to be conducted to assess the level of community participation and circular economy practices within the LGAs.

Future studies are recommended to devise longitudinal frameworks to assess the progress in governance and circular economy integration over a determined period. Research that is focused on a specific sector is needed.

4.2. Recommendations

The following recommendations are made for policy makers:

- Improve and strengthen the institutional capacities of the LGAs by providing special funding along with capacity building at the level of technical training.
- Improve the coherence of policies between the state climate policies and the local government implementing frameworks.
- Delineate and institutionalize the role of communities in the circular economy and climate programs.

Governance, Policies, and Climate Change in the Circular Economy

- Advocate for and promote public–private partnerships in recycling, waste-to-energy, and green enterprises.
- Embed circular economy indicators in the climate monitoring and evaluation systems of the state

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Ethical Statement

This study does not contain any studies with human or animal subjects performed by any of the authors.

Conflicts of Interest

The authors declare that they have no conflicts of interest to this work.

Data Availability Statement

Data are available on reasonable request from the corresponding author.

Author Contribution Statement

All authors have contributed equally in written this paper from beginning to the end.

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Governance, Policies, and Climate Change in the Circular Economy

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