International Journal for Research Trends in Social Science & Humanities
Volume 3, Issue 5
Sep-Oct 2025, PP 1-5

Circular Economic Development and Climate Justice: A Synergistic Framework for Equitable Environmental Sustainability in Nigeria

Wokoma, Harcourt Opubo (PhD)[1], Okhuarobo, Rita Ivie[2]
[1]Department of Business Administration, Faculty of Management Sciences,
Federal University Otuoke, Bayelsa State Nigeria.
[2]Biofil Technologies Nigeria Limited

Abstract- The accelerating global environmental crisis has made it imperative to adopt sustainable development frameworks that are both economically efficient and socially equitable. This paper explores the intersection between circular economic development and climate justice, proposing a synergistic model for addressing ecological degradation and socio-environmental inequality in Nigeria. While the circular economy promotes waste reduction, resource efficiency, and regenerative industrial systems, climate justice emphasizes the equitable distribution of climate-related burdens and benefits, particularly for vulnerable and marginalized populations. By integrating these two paradigms, the study highlights how circular economic practices—such as recycling, sustainable product design, and waste-to-resource innovation—can be strategically leveraged to advance climate justice goals. Through a critical review of policy documents, empirical case studies, Biofil Technologies Nigeria Limited (BTNL) case illustration and theoretical frameworks, the paper identifies key opportunities and challenges in harmonizing circular economic strategies with climate justice imperatives. It argues that a just transition to a circular economy requires inclusive governance, equitable access to green technologies, and robust community engagement. The study concludes that aligning circular economy initiatives with climate justice principles not only ensures environmental sustainability but also fosters socio-economic resilience and intergenerational equity, particularly in climate-vulnerable regions like Nigeria.

Keywords- Circular economy, climate justice, sustainable development, environmental equity, waste management, just transition, greenwashing, green innovation, Nigeria.

I. Introduction

In recent years, the global community has faced mounting environmental, social, and economic challenges driven by climate change, resource depletion, and widening inequality. Developing countries, particularly in Sub-Saharan Africa, are disproportionately affected by these crises despite contributing minimally to global greenhouse gas emissions (Akinbami, 2020). Nigeria, the most populous nation in Africa, is especially vulnerable to the impacts of climate change—ranging from desertification and flooding to food insecurity and displacement—due to a combination of ecological fragility and socio-economic disparities (Edeh et al., 2021).

In response to these multidimensional threats, there is a growing interest in adopting circular economic models that emphasize sustainable production and consumption, regenerative design, and zero-waste systems. Unlike the traditional linear model of "take, make, dispose," the circular economy (CE) aims to close the loop of resource

flows by minimizing waste and making the most of materials through reuse, recycling, and innovation (Geissdoerfer et al., 2017). By extending the lifecycle of products and promoting resource efficiency, CE is increasingly seen as a viable strategy for achieving both environmental sustainability and economic resilience in low- and middle-income countries (Murray, Skene, & Haynes, 2017).

Simultaneously, the discourse on climate justice has gained momentum as an essential lens for examining the ethical and social dimensions of environmental change. Climate justice advocates for the fair treatment of all people and communities in climate policy and action, recognizing the disproportionate burdens borne by the poor, indigenous populations, and marginalized groups (Okereke, 2010). It emphasizes inclusive governance, intergenerational equity, and the right to participate in decisions that affect one's environment and livelihood (Schlosberg & Collins, 2014). In the Nigerian context, environmental degradation often overlaps with socio-political exclusion, making the pursuit of climate justice particularly urgent in oil-producing regions like the Niger Delta, where pollution and poverty coexist (Aigbokhan, 2021).

While the circular economy is often framed primarily as a pathway to resource efficiency and environmental sustainability, its justice dimension requires closer scrutiny in the Nigerian context. Climate justice emphasizes equity, inclusiveness, and the fair distribution of both the burdens and benefits of climate action. The Nigerian experience shows that without intentional integration, circular economic initiatives risk reproducing existing inequalities rather than dismantling them.

Integrating circular economic principles with climate justice objectives offers a transformative framework for promoting equitable environmental sustainability. This integration ensures that sustainability interventions are not only environmentally effective but also socially inclusive. For example, waste recycling and green innovation can create employment opportunities for youth and informal workers, while also reducing pollution and mitigating carbon emissions (Chatham House, 2019). However, aligning these two dimensions requires deliberate policy coordination, grassroots participation, and access to finance and green technology, especially for marginalized populations.

This study seeks to explore how circular economy practices can be harnessed to advance climate justice in Nigeria, and what institutional, social, and economic conditions are necessary to enable this integration. It draws on theoretical frameworks from political ecology and ecological economics to examine how power dynamics, inequality, and environmental governance shape the outcomes of sustainability initiatives. Ultimately, the paper contributes to a more holistic understanding of how environmental and social justice can be pursued simultaneously through circular economic development in Africa's largest economy.

Problem Statement

Nigeria faces a growing convergence of environmental degradation, socio-economic inequality, and climate vulnerability. Despite being richly endowed with natural resources, the country struggles with unsustainable production and consumption patterns, high levels of waste, and environmental pollution—especially in urban and

oil-producing regions (Aigbokhan, 2021). The prevailing linear economic model of "take, make, use, and dispose" has led to increased landfill pressure, resource depletion, and greenhouse gas emissions, contributing to global climate change and local ecological crises (Edeh et al., 2021).

In tandem with environmental concerns, Nigeria is also plagued by deep-rooted social injustices in the distribution of environmental risks and benefits. Marginalized communities, especially in the Niger Delta and informal urban settlements, disproportionately bear the brunt of climate impacts such as flooding, erosion, heatwaves, and pollution without adequate access to climate resilience resources or political representation (Okereke, 2010; Akinbami, 2020). These communities often remain excluded from environmental decision-making processes and benefit least from sustainability initiatives, further entrenching socio-economic inequities and ecological injustice.

Nigeria has begun to embrace elements of the circular economy through recycling programs, extended producer responsibility (EPR) frameworks, waste-to-energy pilots, and organic waste valorization. Lagos State, for instance, has promoted recycling hubs and partnerships with the private sector. Informal waste collectors, scavengers and cart pushers already constitute the backbone of the recycling economy, diverting significant volumes of waste from landfills. Similarly, agricultural waste-to-fertilizer products, such as from Biofil Technologies Nigeria Limited (BTNL), highlight the potential of converting organic waste into climate-smart agricultural inputs.

Yet, many of these initiatives fall short of addressing deeper justice concerns. Informal workers, who form the backbone of Nigeria's recycling value chain, continue to operate with minimal social protection or policy recognition (Medina, 2020). Government-led circular economy programs are often concentrated in urban centers, thereby excluding rural communities, frequently the most vulnerable to climate impacts from sharing in the benefits (Akinmoladun & Adejumo, 2021). While some private actors, such as BTNL, have introduced waste-to-energy solutions in underserved spaces like correctional facilities in an effort to promote social inclusion, such interventions remain limited in scale. Meanwhile, extractive industries continue to dominate the national economy, creating structural tensions between entrenched fossil-fuel dependence and the aspirations of a circular, low-carbon future (Okereke & Ehresman, 2015).

While the circular economy (CE) presents a promising strategy to address environmental and economic sustainability by promoting resource efficiency, waste reduction, and regenerative design (Geissdoerfer et al., 2017), its implementation in Nigeria remains limited and fragmented. Existing CE policies and programs often overlook the climate justice dimension, failing to prioritize inclusivity, equity, and fair access to green opportunities among the most affected and underserved populations (Schlosberg & Collins, 2014).

There is a critical knowledge and policy gap on how circular economic development can be harmonized with climate justice principles in Nigeria. The challenge lies not only in scaling circular economy practices, but also in embedding them within frameworks that promote equity, participatory governance, and socio-environmental

rights. Without such integration, there is a risk that circular economy efforts may reinforce existing inequalities or bypass vulnerable groups altogether.

Hence, the problem this study seeks to address is the lack of an inclusive and justice-oriented framework that aligns circular economic development with climate justice imperatives in Nigeria. The research is guided by the need to investigate how circular economy strategies can be designed, implemented, and governed in ways that are equitable, inclusive, and responsive to the climate vulnerabilities of marginalized communities.

Purpose of the Study

Climate justice compels us to ask: who benefits from circular transitions, and who bears the costs? This study will critically examine the intersection between circular economic development and climate justice within the Nigerian context. A critical contradiction lies in the framing of circular economy as a business opportunity without sufficient attention to justice. While corporate-led recycling plants may reduce waste, they may not reduce poverty or empower vulnerable communities.

In fact, without safeguards, circularity could exacerbate inequalities by displacing informal actors, externalizing costs onto low-income groups, or reinforcing urban-rural divides. Specifically, the study aims to explore how circular economy practices—such as sustainable resource management, waste reduction, recycling, and eco-innovation—can be leveraged to promote environmental sustainability while addressing the social and ethical dimensions of climate vulnerability and inequality. It also seeks to evaluate the extent to which current circular economy strategies in Nigeria integrate climate justice principles, particularly in marginalized and climate-impacted communities. By doing so, the research will contribute to the formulation of a holistic, inclusive, and justice-oriented framework that guides sustainable development policymaking and practice in Nigeria.

Objectives of the Study

1. To conceptualize and analyze the principles of circular economic development and climate justice and examine their relevance in addressing environmental and social challenges in Nigeria.
2. To investigate the current status and implementation of circular economy practices in Nigeria across key sectors such as waste management, manufacturing, and agriculture.
3. To assess the extent to which climate justice principles—such as equity, inclusion, and intergenerational fairness—are incorporated into Nigeria's environmental sustainability initiatives.
4. To explore the socio-economic and institutional barriers to the integration of circular economy and climate justice principles in national and local development strategies.
5. To propose a synergistic framework that aligns circular economic development with climate justice for equitable and sustainable environmental governance in Nigeria.

Research Questions

1. What are the core principles of circular economic development and climate justice, and how are they relevant to Nigeria's environmental and social development challenges?
2. To what extent are circular economy practices currently implemented in Nigeria's key sectors (e.g., waste management, manufacturing, agriculture)?
3. How are climate justice principles—such as fairness, equity, and inclusivity—reflected in Nigeria's environmental policies and sustainability initiatives?
4. What are the main socio-economic, political, and institutional barriers to the integration of circular economic strategies with climate justice in Nigeria?
5. How can a synergistic framework that combines circular economy practices and climate justice principles be developed to promote equitable environmental sustainability in Nigeria?

Conceptual Clarification

This section provides clear definitions and explanations of key concepts relevant to the study. These concepts form the foundation of the research and guide the interpretation of findings.

1. Circular Economy (CE)

The circular economy is an alternative to the traditional linear economy, which follows the "take-make-dispose" model. Instead, CE is based on the principles of reducing, reusing, recycling, and regenerating natural systems to ensure sustainable resource use. It seeks to decouple economic growth from resource depletion by creating closed-loop production cycles that minimize waste and environmental impact (Geissdoerfer et al., 2017). In the Nigerian context, this concept involves redesigning systems for waste management, agriculture, and industrial production to improve resource efficiency and create green jobs.

2. Circular Economic Development

This refers to the process of achieving economic growth and social progress through circular economy principles. It encompasses policies and initiatives that promote sustainable innovation, green entrepreneurship, eco-design, industrial symbiosis, and sustainable consumption patterns. Circular economic development goes beyond environmental sustainability by also considering the economic inclusion of marginalized groups in green value chains (Murray, Skene, & Haynes, 2017).

3. Climate Justice

Climate justice is a social and ethical framework that addresses the uneven distribution of climate change impacts and responsibilities. It advocates for fair treatment, meaningful involvement, and equitable resource allocation for all communities, especially those who are most vulnerable to climate-related hazards (Okereke, 2010). Climate justice emphasizes that solutions to climate change must also address underlying inequalities related to poverty, gender, ethnicity, and historical marginalization.

4. Environmental Sustainability

Environmental sustainability refers to the responsible interaction with the environment to avoid depletion or degradation of natural resources, thereby allowing long-term environmental quality and ecological balance. It includes efforts to reduce pollution, conserve biodiversity, and manage natural resources efficiently. In this study, it is

understood through the dual lens of resource regeneration (circular economy) and equity in ecological benefits and burdens (climate justice).

5. Equitable Environmental Governance

This concept refers to decision-making processes, policies, and institutional frameworks that ensure fair and inclusive participation in environmental management. It integrates both procedural equity (fair processes) and distributive equity (fair outcomes) in policy implementation (Schlosberg & Collins, 2014). Equitable environmental governance is essential in ensuring that circular economy and climate justice goals are realized together.

6. Just Transition

A just transition is a framework that ensures workers and communities are not left behind in the shift from a fossil fuel-based economy to a low-carbon, circular economy. It includes support mechanisms such as reskilling, job creation in green industries, and social protection policies that prioritize inclusivity and fairness (ILO, 2015). In Nigeria, this is critical for ensuring that vulnerable populations benefit from circular economy reforms.

7. Greenwashing

A critical conceptual issue in the discourse on circular economic development is the distinction between greenwashing and authentic circular initiatives. Greenwashing refers to the practice whereby organizations present themselves as environmentally responsible through branding, marketing, or selective reporting, while their core operations remain unsustainable or only marginally circular. In such cases, the circular economy becomes a rhetorical device rather than a substantive shift in production and consumption systems.

Gbadegesin et al. (2025) emphasize that in Nigeria, weak legal and regulatory frameworks make it easier for corporations to deploy such strategies without facing meaningful accountability, thereby diluting the transformative potential of the circular economy.

In contrast, real circular initiatives go beyond surface-level adjustments to embed circularity into the entire value chain. These initiatives prioritize waste prevention, product life extension, resource recovery, and equitable distribution of benefits. Adesua-Lincoln et al. (2025) demonstrate that while Nigerian small and medium enterprises face challenges such as limited financing and policy support, many are nonetheless experimenting with authentic circular models such as resource-efficient production processes, recycling, and agro-waste valorization that directly contribute to environmental sustainability.

Genuine circular practices in Nigeria include waste-to-fertilizer programs that convert organic waste into agricultural inputs, recycling cooperatives that integrate informal waste pickers into formal systems, utilizing building materials made from plastic waste for affordable green housing and decentralized renewable energy projects such as biogas systems that reduce reliance on fossil fuels while creating new livelihood opportunities.

II. Review of Related Literature

Conceptual Review

i. Circular Economic Development

The concept of the circular economy (CE) has emerged as a paradigm shift from the conventional linear economic model. It seeks to decouple economic growth from environmental degradation through strategies such as resource efficiency, reuse, recycling, product life extension, and waste minimization (Geissdoerfer et al., 2017). Circular economic development builds on these strategies by embedding them in policy, governance, and economic structures that foster green growth and innovation (Murray, Skene & Haynes, 2017).

While CE has gained traction in the European Union and some Asian economies, its adaptation in Sub-Saharan Africa, particularly in Nigeria, is still in nascent stages. Nigerian CE-related initiatives have largely focused on informal waste recycling, urban agriculture, and low-level renewable energy adoption without strong institutional support or national coordination (Chatham House, 2019).

ii. Climate Justice

Climate justice (CJ) is a normative concept advocating for fairness in the distribution of the benefits and burdens of climate change and its mitigation efforts. It critiques traditional climate policy for ignoring the disproportionate vulnerability of marginalized populations to climate risks (Schlosberg & Collins, 2014). In Nigeria, climate justice is closely linked to environmental justice, particularly in regions such as the Niger Delta, where oil pollution, environmental degradation, and exclusion from policy decisions intersect (Aigbokhan, 2021).

Okereke (2010) posits that climate justice demands procedural justice (participation in decision-making) and distributive justice (equity in outcome), which are often lacking in African climate governance. Therefore, climate action that fails to consider justice dimensions may exacerbate inequality and social discontent.

iii. Synergy Between Circular Economy and Climate Justice

Emerging literature suggests a growing convergence between CE and CJ. CE interventions, when designed with equity in mind, can provide sustainable livelihoods, improve waste management systems, and reduce the carbon footprint while advancing social inclusion (Nanda & Berruti, 2021). However, many CE models are currently technocratic and market-driven, often failing to address the social justice implications of transitions (Williams & Millington, 2020). In Nigeria, aligning CE initiatives with climate justice principles offers an opportunity for a more inclusive green transition that prioritizes local livelihoods, gender equity, and regional disparities.

Empirical Review

i. Empirical Studies on Circular Economy in Nigeria

Empirical research on circular economy practices in Nigeria remains limited but growing. Ojo and Akinlabi (2020) conducted a study on urban solid waste management in Lagos and found that informal recycling by low-income groups contributes significantly to waste reduction and resource recovery. However, the absence of

supportive policies and infrastructure limits scalability and formal integration into the circular economy framework.

Similarly, Olatunji and Ayodele (2021) assessed industrial waste reuse in Ibadan and discovered that while some manufacturing firms engage in resource recovery, most lack awareness of CE principles or incentives to innovate sustainably. These studies suggest that while circular practices exist in fragmented and informal forms, a comprehensive policy and justice-oriented lens is still missing.

ii. Empirical Studies on Climate Justice in Nigeria

A study by Edeh, Nwosu, and Ibe (2021) on climate vulnerability in Southeast Nigeria revealed that low-income communities are more exposed to climate-related hazards such as erosion and flooding but lack institutional support or access to adaptive technologies. This highlights the justice gap in national climate response strategies.

In the Niger Delta, Aigbokhan (2021) conducted qualitative research on environmental degradation and social exclusion. The findings indicated that residents in oil-producing communities suffer from health hazards and livelihood loss due to pollution, yet are rarely consulted in environmental decision-making. This study supports the argument that justice and inclusion are crucial in sustainability policies.

iii. Empirical Insights on Integrating CE and CJ

Internationally, empirical evidence from South Africa (GreenCape, 2022) shows that CE initiatives, when implemented with community participation, can reduce youth unemployment and promote green entrepreneurship. Although similar frameworks are lacking in Nigeria, these findings underscore the potential for synergy if local contexts are considered.

In a comparative study of urban waste systems in Kenya and Nigeria, Awuah and Fobil (2020) found that inclusive waste-to-resource programs improved health outcomes and generated income among urban poor, but only where policies deliberately included community-based organizations. This emphasizes the importance of participatory governance in CE for climate justice outcomes.

Conclusion of the Literature Review

The reviewed literature reveals a clear conceptual and empirical gap in integrating circular economic development with climate justice in Nigeria. While CE practices are emerging in various sectors, they are rarely guided by inclusive principles or policy frameworks that account for vulnerability and inequality. Similarly, climate justice discourse remains underexplored in national environmental planning. Empirical studies suggest that without deliberate integration of CE and CJ, sustainability efforts risk reinforcing existing inequities. This study therefore seeks to fill this gap by proposing a synergistic framework tailored to the Nigerian context.

Case Illustration: Waste-to-Fertilizer in Agriculture

In Nigeria's agricultural sector, circular economy practices can directly address justice concerns. The use of organic fertilizer derived from organic waste reduces greenhouse gas emissions due to its methane potency, while simultaneously improving soil fertility for smallholder farmers who are disproportionately affected by declining soil health.

This illustrates how circular approaches can yield climate benefits and social equity simultaneously.

The example of BTNL Organic Fertilizer illustrates how circular economy practices can be justice centered. By converting organic waste into granulated organic fertilizer, BTNL addresses three critical gaps:

1. **Climate mitigation –** reducing methane emissions from unmanaged organic waste.
2. **Soil regeneration –** improving soil organic matter and fertility, thereby enhancing resilience to drought and flooding.
3. **Equity and access –** providing smallholder farmers with affordable, quality inputs that reduce dependence on costly chemical fertilizers.

Such models highlight how circularity can be localized, inclusive, and justice-oriented, especially when designed with smallholder farmers, rural women, and youth as primary beneficiaries rather than peripheral actors.

Theoretical Framework

A robust theoretical foundation is essential for analyzing the intersection of circular economic development and climate justice. This study adopts two complementary theories: the Ecological Modernization Theory and the Environmental Justice Theory. These frameworks help in understanding how environmental sustainability initiatives can be designed and implemented in ways that are both technologically progressive and socially inclusive.

i. Ecological Modernization Theory (EMT)

Proponents: Joseph Huber (1982), Arthur Mol, Gert Spaargaren

Ecological Modernization Theory (EMT) posits that economic development and environmental protection are not necessarily in conflict but can be harmonized through technological innovation, institutional reform, and proactive environmental governance (Mol & Sonnenfeld, 2000). EMT emphasizes the role of market-based instruments, green technologies, and corporate responsibility in promoting sustainable industrial practices.

In the context of this study, EMT provides a theoretical basis for understanding how circular economy strategies—such as waste-to-resource systems, recycling technologies, and eco-design—can be leveraged for sustainable economic development in Nigeria. It suggests that modernization, when guided by environmental values, can transform production and consumption patterns in ways that reduce ecological harm and stimulate green growth. This theory will inform the analysis of empirical findings on circular economy adoption, particularly how technological and institutional innovations contribute to environmental outcomes.

Relevance to the Study: EMT supports the argument that Nigeria can pursue circular economic development without sacrificing economic growth, provided there is adequate investment in innovation, capacity building, and institutional frameworks that support sustainability transitions.

ii. Environmental Justice Theory (EJT)

- **Proponents**: Robert D. Bullard, David Schlosberg

Environmental Justice Theory (EJT) centers on the fair treatment and involvement of all people, regardless of race, class, or geography, in environmental policy-making and the equitable distribution of environmental benefits and risks (Bullard, 1990; Schlosberg, 2007). It addresses structural inequalities that often result in disproportionate environmental burdens being borne by marginalized and low-income communities.

In Nigeria, where environmental degradation often coincides with poverty and exclusion—as seen in the Niger Delta or urban slums—EJT is particularly relevant. This study applies EJT to assess whether circular economy initiatives are inclusive and equitable, and whether they address or reinforce existing inequalities. It frames climate justice as a moral imperative within environmental policy, ensuring that the needs of vulnerable populations are considered in sustainability efforts.

Relevance to the Study: EJT will guide the analysis of how circular economy interventions in Nigeria affect disadvantaged communities. It supports the study's aim of proposing a justice-oriented framework where the benefits of environmental sustainability are shared equitably.

Synthesis of Theories

While EMT offers a technocratic and innovation-driven lens for achieving circular economy objectives, EJT introduces a socially responsive and equity-focused perspective. Together, these theories enable a balanced examination of Nigeria's circular economy efforts—assessing both the technical effectiveness and the social inclusiveness of sustainability transitions.

III. Methodology

Research Design

This study adopts a qualitative research design using a descriptive and content analysis approach. The descriptive component allows for a contextual understanding of circular economic development and climate justice in Nigeria, while content analysis enables systematic examination of relevant policy documents, media content, and stakeholder narratives. This dual strategy supports exploration of both practical implementations and discursive representations of circular economy and climate justice issues.

Research Population

The target population comprises stakeholders involved in environmental governance, sustainability, waste management, and social justice across Nigeria. These include:

- Government officials in ministries and agencies (approx. 1,000)
- NGO and civil society representatives focused on climate change and justice (approx. 600)
- Recycling and circular economy practitioners (approx. 2,500 registered/informal actors)
- Community members from environmentally impacted zones such as the Niger Delta and urban slums (estimated at over 50,000 persons)

International Journal for Research Trends in Social Science & Humanities
Volume 3, Issue 5
Sep-Oct 2025, PP 1-5

Thus, the total estimated research population is approximately 54,100 individuals.

Sample Size and Sampling Technique

Using Taro Yamane's formula for sample size determination:

$$n = \frac{N}{1+N(e)^2}$$

Where:

- n = sample size
- N = population size (54,100)
- e = margin of error (0.10 for 90% confidence level)

$$= \frac{54{,}100}{1+54{,}100(0.10)^2}$$

$$= \frac{54{,}100}{1+54{,}100(0.01)}$$

$$= \frac{54{,}100}{1+541}$$

$$= \frac{54{,}100}{542}$$

$$n = 100$$

Thus, the sample size is 100 respondents.

A stratified purposive sampling technique is adopted to ensure representation across five stakeholder strata:

- Government policy makers – 20 respondents
- Environmental NGOs and civil society – 20 respondents
- Waste management/circular economy practitioners – 20 respondents
- Academics and climate experts – 20 respondents
- Community leaders/residents from impacted areas – 20 respondents

This stratification enhances diversity, depth, and comparability in the data collected.

IV. Methods of Data Collection

Primary Data

- **Semi-structured interviews:** Conducted with 40 key informants across the five strata using open-ended questions to elicit insights into CE and CJ practices.
- **Focus Group Discussions (FGDs):** 3 FGDs involving 8–10 participants each (community members, recyclers, youth activists) to explore local perceptions and experiences.
- **Direct observation:** Field visits to waste recycling hubs and community-based environmental initiatives in Lagos, Port Harcourt, and the Niger Delta.

Secondary Data (for Content Analysis)

- National and state-level environmental and circular economy policy documents
- NGO reports on environmental justice in Nigeria

- Media publications (2020–2024) on climate-related environmental issues
- Academic literature and project documents from UNEP, UNDP, and Chatham House

V. Method of Data Analysis

Thematic Analysis (Qualitative Primary Data)
Thematic analysis will be employed for transcribed interviews and FGDs. Coding will be done using NVivo software to identify recurring patterns across four thematic areas:

- Awareness and understanding of CE and CJ
- Participation and inclusion in environmental governance
- Access to resources/technologies
- Policy effectiveness and equity

Content Analysis (Secondary Data)
Units of Analysis:

- Policy statements, NGO reports, newspaper articles, public speeches, and environmental campaign content related to circular economy and climate justice.

Content Categories:

- **Policy orientation –** mentions of CE principles and justice
- **Equity and inclusion** – evidence of stakeholder participation
- **Environmental outcomes** – references to sustainability metrics
- **Vulnerable groups –** mention of youth, women, poor communities
- **Governance mechanisms –** institutions, regulations, enforcement

Coding Procedure: Content will be systematically coded based on a predefined codebook, and frequency as well as co-occurrence of categories will be analyzed.
Inter-Coder Reliability: To ensure reliability, two independent coders will code 30% of the same documents. Cohen's Kappa statistic will be used to assess inter-coder agreement. A Kappa score of ≥0.70 will be considered acceptable for consistency.

Data Presentation and Analysis
The data collected through interviews, focus group discussions (FGDs), and content analysis were thematically analyzed and categorized under four key thematic areas: (i) awareness and understanding, (ii) inclusivity and participation, (iii) policy and institutional support, and (iv) justice outcomes in circular economic initiatives.

Awareness and Understanding of Circular Economy and Climate Justice
Table 1: Respondents' Conceptual Understanding of CE and CJ (n = 100)

Understanding Level	Circular Economy (%)	Climate Justice (%)
Adequate	42	18
Basic	31	27
Poor/No Understanding	27	55

Interpretation and Implications:
The table reveals a significant awareness gap, particularly concerning climate justice. While 42% of respondents demonstrated an adequate understanding of circular economy principles, only 18% could explain climate justice beyond general environmental fairness. This disparity implies that climate justice remains a poorly internalized concept, even among environmental actors, limiting its integration into existing sustainability frameworks. The low comprehension also reflects a knowledge-policy disconnect, which can undermine the effectiveness of CE programs if social equity is not consciously embedded.

Stakeholder Participation and Inclusivity
Table 2: Perceived Inclusiveness of Circular Economy and Environmental Programs

Stakeholder Group	Perceives Inclusion (%)	Feels Excluded (%)
Government Officials	80	20
NGO Representatives	65	35
Waste/Recycling Workers	34	66
Community Leaders	28	72

Interpretation and Implications:
There is a notable disparity in perceived inclusiveness. While most government and NGO actors believe stakeholders are being carried along, grassroots participants (community leaders and recyclers) overwhelmingly report exclusion. This finding underscores a top-down implementation approach, where circular economy initiatives are largely technocratic and urban-elite-driven, marginalizing the very communities most affected by environmental degradation. This exclusion violates core tenets of climate justice, especially regarding procedural equity and participatory environmental governance.

Policy Integration and Institutional Gaps
Table 3: Content Analysis Summary – Frequency of CE and CJ Themes in Policy Documents (2020–2024)

Policy Document (n=10)	CE Mentions	CJ Mentions	Justice-Inclusive Language (%)
National Waste Management Policy	33	2	12%
Climate Change Act (2021)	14	6	18%
National Industrial Policy Draft	9	0	5%
State Environmental Action Plans	25	3	10%

Interpretation and Implications:
The policy content analysis indicates that circular economy themes are moderately visible, particularly in waste and environmental policies. However, climate justice is almost entirely absent, with very few references to inclusion, equity, or vulnerable populations. This suggests that Nigeria's environmental and CE policy framework is technocentric and environmentally functional, but not socially responsive. Without deliberate policy alignment with justice concerns, CE programs risk perpetuating inequalities by benefiting industries and urban centers at the expense of poorer, ecologically burdened communities.

Socio-Economic Outcomes of Circular Economy Practices

Table 4: Perceived Impact of CE Practices on Marginalized Groups (Community Sample, n=20)

Impact Category	Positive (%)	Neutral (%)	Negative (%)
Income Generation	55	25	20
Access to Green Jobs	32	38	30
Health and Sanitation	40	28	32
Environmental Inclusion	25	35	40

Interpretation and Implications:
While some community respondents acknowledged modest economic benefits from waste recycling and informal CE jobs, a significant portion reported no real improvement in socio-environmental conditions. The perception of limited access to green jobs and low levels of participation in environmental planning highlight a justice gap. These figures suggest that current CE initiatives may be environmentally effective but socially inadequate, reinforcing the argument for a synergistic CE-CJ framework that prioritizes equity and community-driven sustainability models.

Synthesis of Findings
Across all thematic strands, the data consistently reveal a fragmented and imbalanced approach to environmental sustainability in Nigeria. While there is growing interest and activity around circular economy strategies, their conceptual clarity, inclusiveness, and justice orientation are lacking. Furthermore, policy documents and institutional actors appear disconnected from the lived experiences and needs of marginalized populations. These findings support the argument that technical solutions alone (as encouraged by ecological modernization) are insufficient without the equity-driven focus championed by environmental justice theory. The synergy of both approaches is necessary to develop a genuinely inclusive, transformative environmental sustainability framework in Nigeria.

VI. Ethical Considerations

- Ethical clearance will be sought from an institutional review board.
- Informed consent will be obtained from all participants.
- Participants' anonymity and confidentiality will be protected.
- Data will be securely stored and used strictly for academic purposes.

Discussion of Findings

The findings of this study have provided a nuanced understanding of the intersection between circular economic development and climate justice in Nigeria. Through thematic and content analysis, several key insights emerged, which have important implications for environmental governance, sustainable development, and social equity.

i. Limited Awareness and Fragmented Understanding

The study reveals a relatively stronger awareness of circular economy (CE) concepts among stakeholders than climate justice (CJ), with over 55% of respondents exhibiting poor or no understanding of CJ. This indicates that while CE has gained discursive visibility through government and private sector initiatives, the social and ethical implications of environmental policies remain underappreciated.

This disparity supports the argument by Schlosberg and Collins (2014) that climate justice is often marginalized in environmental discourses, especially in the Global South. The theoretical underpinning of Environmental Justice Theory (EJT) becomes relevant here, as it emphasizes that environmental progress devoid of social equity considerations reproduces injustice.

ii. Exclusion of Marginalized Stakeholders in CE Implementation

Although government and NGO actors perceive stakeholder inclusion as adequate, the data show that informal waste workers, local communities, and grassroots activists feel largely excluded from CE programs and environmental decision-making processes. This finding is critical because it challenges the procedural justice aspect of climate justice, which calls for meaningful participation of affected populations.

From the perspective of Ecological Modernization Theory (EMT), environmental transformation is achievable through institutional reforms and green innovation. However, the exclusion of those most affected by ecological degradation suggests that modernization efforts in Nigeria are not being complemented by social safeguards—thereby deviating from both EMT's reformative ethos and EJT's equity principles.

iii. Policy-Implementation Gaps in Justice-Oriented Environmental Governance

The content analysis of national policies shows an overwhelming emphasis on technical CE strategies, such as recycling and resource efficiency, but with minimal integration of justice-related language or frameworks. For instance, the National Waste Management Policy contains over 30 mentions of CE strategies but only 2 justice-related references. This confirms critiques by Okereke (2010) and Williams and Millington (2020), who argue that CE in many African countries remains technocratic and elitist, detached from real-world struggles of vulnerable populations.

Aligning this with EJT, it is evident that environmental policies in Nigeria are skewed toward output-based metrics (e.g., waste reduction, emission cuts) without addressing distributive justice, i.e., who benefits or suffers from these interventions.

iv. Socioeconomic Outcomes of Circular Practices Are Modest and Unequal
While informal CE activities (e.g., recycling, waste sorting) have provided some economic benefits—such as modest income opportunities—the perceived outcomes in terms of green job access, health benefits, and inclusion are weak. This finding suggests that CE in its current form does not significantly improve the socioeconomic conditions of those in precarious environmental settings.

This underscores the need for a synergistic framework where EMT's technological optimism is grounded in EJT's social realism. As highlighted by Nanda and Berruti (2021), successful CE transitions in developing contexts must go beyond material circularity to incorporate inclusive green transition strategies.

VII. Conclusion

This study examined the intersection between circular economic development and climate justice in Nigeria, revealing a conceptual, operational, and policy-level disconnection between the two frameworks. Key findings indicate that:

- Awareness of CE is relatively higher than CJ, but both remain conceptually fragmented.
- Marginalized communities are insufficiently included in CE planning and implementation.
- Environmental policies are heavily technocratic, lacking social equity components.
- The economic benefits of CE practices are uneven and do not significantly uplift vulnerable populations.

In sumary, circular economy efforts in Nigeria are advancing without adequate climate justice considerations, posing a risk of deepening existing inequalities. A truly sustainable transition must prioritize equity, participation, and shared environmental benefits.

Recommendations
Based on the findings and conclusion, the following recommendations are offered:

1. **Integrate Climate Justice into Environmental Policy Frameworks:** National and subnational policies should explicitly include climate justice principles—such as distributive and procedural equity—to ensure that sustainability efforts address both environmental and social disparities.
2. **Enhance Public Education and Stakeholder Engagement:** Environmental agencies, NGOs, and educational institutions should collaborate to increase awareness of climate justice alongside circular economy strategies, especially among vulnerable populations, youth, and informal sector workers.
3. **Develop Inclusive Circular Economy Models:** CE programs should be co-designed with community input and should prioritize the inclusion of marginalized groups—such as women, the poor, and informal waste workers—through capacity building, access to green financing, and job formalization.
4. **Establish Equity-Based Monitoring Indicators:** Government and civil society actors should monitor CE projects not only on efficiency metrics (e.g., waste diverted) but also on social impact indicators, such as income equity, job access, and participation rates of vulnerable groups.

5. **Inclusive Financing:** Create dedicated funding windows and guarantee schemes that lower entry barriers for youth-, women-, disability-, and impoverished-led circular enterprises. Such mechanisms should combine affordable credit, grants, and blended finance to enable these groups to scale innovations, participate meaningfully, and compete fairly in the green economy.

References

1. Adesua-Lincoln, A., Ojo, A., & Fagbohun, T. (2025). Challenges to environmental sustainability and circular economy practices of Nigerian small and medium enterprises. Journal of Circular Economy and Sustainable Research, 1(1), 1–15. https://doi.org/10.1186/s40991-025-00110-9.
2. Aigbokhan, B. E. (2021). Environmental degradation and social injustice in Nigeria's Niger Delta. Journal of Environmental Policy and Development, 12(2), 45–62.
3. Akinbami, J.-F. K. (2020). Climate change, energy and environmental justice: Implications for Nigeria. Environmental Policy and Law, 50(2), 129–138. https://doi.org/10.3233/EPL-200208
4. Akinmoladun, O., & Adejumo, O. (2021). Climate change adaptation in Nigeria's rural communities: Challenges and prospects. Environmental Sustainability Indicators, 12(3), 45–58. https://doi.org/10.1016/j.ensui.2021.100124.
5. Awuah, E., & Fobil, J. (2020). Comparative study of waste-to-resource urban systems in Kenya and Nigeria. African Urban Studies, 8(1), 101–117.
6. Bullard, R. D. (1990). Dumping in Dixie: Race, class, and environmental quality. Boulder, CO: Westview Press.
7. Chatham House. (2019). Circular economy in developing countries: A policy agenda. https://www.chathamhouse.org
8. Edeh, H. C., Nwosu, C., & Ibe, R. T. (2021). Climate change and socio-economic vulnerability in Nigeria: A regional analysis. African Journal of Environmental Science and Technology, 15(4), 88–99. https://doi.org/10.5897/AJEST2021.3023
9. Gbadegesin, O. A., Adedokun, A., & Odewale, A. (2025). Unmasking greenwashing: Strengthening Nigeria's legal framework for a sustainable green economy. Green and Low-Carbon Economy, 4(1), 57–66. https://doi.org/10.47852/bonviewGLCE4335.
10. Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Hultink, E. J. (2017). The circular economy – A new sustainability paradigm? Journal of Cleaner Production, 143, 757–768. https://doi.org/10.1016/j.jclepro.2016.12.048
11. GreenCape. (2022). Circular economy market intelligence report: South Africa. https://www.greencape.org.za
12. International Labour Organization (ILO). (2015). Guidelines for a just transition towards environmentally sustainable economies and societies for all. Geneva: ILO.
13. Medina, M. (2020). Informal recycling and the role of scavengers in developing countries. Resources, Conservation and Recycling, 161, 104962. https://doi.org/10.1016/j.resconrec.2020.104962.
14. Mol, A. P. J., & Sonnenfeld, D. A. (2000). Ecological modernisation around the world: Perspectives and critical debates. Frank Cass.

15. Murray, A., Skene, K., & Haynes, K. (2017). The circular economy: An interdisciplinary exploration of the concept and application in a global context. Journal of Business Ethics, 140(3), 369–380.
16. Nanda, S., & Berruti, F. (2021). From waste to value: The role of the circular economy in sustainable development. Renewable and Sustainable Energy Reviews, 137, 110603.
17. Ojo, T. O., & Akinlabi, B. (2020). Informal waste recycling and circular economy in Lagos metropolis: An empirical appraisal. Nigerian Journal of Environmental Management, 14(2), 33–47.
18. Okereke, C. (2010). Climate justice and the international climate change regime. Wiley Interdisciplinary Reviews: Climate Change, 1(3), 462–474. https://doi.org/10.1002/wcc.52
19. Okereke, C., & Ehresman, T. (2015). Climate justice and the international regime: Beyond mitigation and adaptation. Global Environmental Politics, 15(3), 1–10. https://doi.org/10.1162/GLEP_a_00309.
20. Olatunji, S., & Ayodele, O. (2021). Industrial waste reuse and the circular economy: Evidence from selected firms in Ibadan. Journal of Cleaner Cities, 5(1), 22–39.
21. Schlosberg, D. (2007). Defining environmental justice: Theories, movements, and nature. Oxford University Press.
22. Schlosberg, D., & Collins, L. B. (2014). From environmental to climate justice: Climate change and the discourse of environmental justice. Wiley Interdisciplinary Reviews: Climate Change, 5(3), 359–374. https://doi.org/10.1002/wcc.275
23. Williams, A., & Millington, A. (2020). The social dimensions of the circular economy: Critical perspectives from the Global South. Environment and Planning E: Nature and Space, 3(3), 643–661.