

P-ISSN: 2315-9391 AJAF September 2025,
9(2) 103-117

Corresponding Author:
Danjuma Mohammed (PhD)
Department of Accounting
Adamawa State University Mubi
mohammed509@adsu.edu.ng

Taxation and Environmental Sustainability: Evaluating the Potential for Green Tax Policies Targeting MSMEs in Adamawa State

¹ Mauda Ahmed Bakari (PhD)

Department of Taxation

Adamawa State University Mubi bakari531@adsu.edu.ng

² Danjuma Mohammed (PhD)

Department of Accounting

Adamawa State University Mubi mohammed509@adsu.edu.ng

Abstract

This study examines the role of green tax policies in promoting environmental sustainability among Micro, Small, and Medium Enterprises (MSMEs) in Adamawa State, Nigeria, within the framework of Nigeria's 2025 tax reforms. Using a mixed-methods approach, the research analyses how green tax instruments influence environmental compliance and sustainable business practices. The findings indicate that green tax incentives effectively encourage eco-friendly production and resource efficiency among MSMEs, but their impact is limited by low awareness, financial constraints, and weak enforcement. The study highlights the importance of complementary policy measures, including targeted tax reliefs, capacity building, and improved regulatory clarity, and contributes empirical evidence to debates on environmental fiscal reforms in sub-Saharan Africa.

Keywords: Green taxation; Environmental sustainability; MSMEs; Tax policy reform; Nigeria; Adamawa State

1.0 Introduction

Environmental sustainability has emerged as a critical policy concern globally as countries grapple with climate change, environmental degradation, and the depletion of natural resources. Developing economies face a dual challenge of sustaining economic growth while mitigating environmental harm, particularly in contexts where regulatory capacity and enforcement mechanisms remain weak. Fiscal policy instruments, especially taxation, are increasingly recognised as effective tools for influencing private sector behaviour by internalising environmental externalities and incentivising environmentally responsible practices (OECD, 2021).

In Nigeria, environmental pressures associated with industrial activity, urbanisation, and small-scale enterprise operations have intensified in recent decades. Micro, Small, and Medium Enterprises (MSMEs) constitute the backbone of the Nigerian economy, accounting for a significant share of employment, income generation, and local economic development (SMEDAN & NBS, 2023). However, many MSMEs operate with limited environmental safeguards, contributing to inefficient energy use, poor waste management, and localised pollution. These challenges are particularly evident at the sub-national level, where institutional capacity and access to green technologies are constrained. Recent fiscal reforms embodied in Nigeria's 2025 tax reform framework, including the Nigeria Tax Act (NTA), represent the most comprehensive restructuring of the country's tax system in decades. The reforms aim to simplify tax administration, broaden the tax base, enhance compliance, and modernise revenue mobilisation (KPMG, 2025). Importantly, the new framework provides a policy window for integrating environmental fiscal instruments, such as green taxes and targeted incentives, into the national tax

architecture. This creates opportunities to align taxation with Nigeria's environmental and sustainable development objectives.

Despite the growing policy interest, empirical evidence on the effectiveness of green tax policies targeting MSMEs in Nigeria remains limited, particularly at the state level. Adamawa State presents a relevant case due to its growing MSME sector, reliance on resource-intensive activities, and vulnerability to environmental stressors. This study therefore examines the potential of green tax policies to promote environmentally sustainable business practices among MSMEs in Adamawa State within the context of Nigeria's 2025 tax reforms. By doing so, it contributes to ongoing debates on environmental fiscal reform in developing economies and provides evidence-based insights for policymakers.

Micro, Small, and Medium Enterprises (MSMEs) play a critical role in the economic development of Adamawa State, contributing significantly to employment, income generation, and local economic growth. MSMEs have grown rapidly but at an environmental cost. These businesses can pollute, waste energy, and degrade the environment due to a lack of sustainability awareness and resources. Economic growth and environmental protection must be balanced as global attention shifts to sustainable development. Green tax policies, which encourage businesses to adopt environmentally friendly practices, are being considered by governments worldwide as a way to achieve this balance. Green taxes can regulate and incentivize MSMEs to reduce their environmental impact, supporting sustainability goals. Environmental taxation, especially for MSMEs, is underdeveloped in Adamawa State. Current tax policies prioritize revenue over ecological impact. The state must promote MSME growth and environmental sustainability as it pursues economic development. Green tax policies for Adamawa State MSMEs will be

assessed in this study. It will examine how to encourage sustainable business practices without stifling economic growth. The study will also assess MSMEs' green business readiness and green tax effects. The research aims to help Adamawa State policymakers integrate environmental sustainability into taxation.

The rapid expansion of Micro, Small, and Medium Enterprises (MSMEs) in Adamawa State has been a significant driver of economic growth, contributing to employment creation, poverty reduction, and local economic development.

Despite the evident environmental challenges, the current tax policies in Adamawa State focus primarily on revenue generation, with minimal consideration given to the ecological footprints of MSMEs. This lack of environmentally oriented tax policies has resulted in a gap where businesses are not incentivized to adopt sustainable practices. Consequently, the unchecked environmental impact of MSMEs continues to grow, threatening long-term sustainability.

Moreover, the absence of green tax policies creates an imbalance, where the environmental costs associated with MSME activities are not adequately internalized. This failure to integrate environmental considerations into the taxation system limits the state's ability to promote sustainable development effectively. The primary objective of this study is to evaluate the potential for implementing green tax policies targeting Micro, Small, and Medium Enterprises (MSMEs) in Adamawa State, to promote environmental sustainability without hindering economic growth. Specifically, the study seeks to assess the environmental impacts of MSME activities in Adamawa State: to understand the extent of their ecological footprints and identify key areas where green tax policies could be effective.

2.0 Literature Review

Green taxation, often called environmental or eco-taxation, involves the imposition of taxes on

activities that are harmful to the environment, with the dual aim of reducing environmental damage and generating revenue that can be reinvested in sustainability initiatives. Green taxes are based on the "polluter pays" principle, which states that polluters should pay for pollution mitigation (Pearce, 1991). MSMEs are crucial to economic growth, especially in developing nations. However, their environmental impact is significant. Due to size and resource constraints, MSMEs cannot often implement sustainable practices (Revell et al., 2010). The taxation framework for MSMEs in Nigeria prioritizes revenue generation over environmental impacts. MSMEs pay Company Income Tax, Value-Added Tax, and Education Tax, according to the FIRS (2021). Countries with advanced green tax policies demonstrate how to implement environmental taxation. Sweden's 1991 carbon tax has reduced greenhouse gas emissions while maintaining economic growth (Andersson, 2019). Implementing green taxes in developing countries like Nigeria is difficult. MSMEs have low profit margins, so more taxes could hurt their growth (Nguyen & Pham, 2020). Nigeria's National Environmental Standards and Regulations Enforcement Agency (NESREA) implements environmental policies and regulations to promote sustainability (NESREA, 2020). Green Tax Policy Prospects in Adamawa State With its growing MSME sector, Adamawa State could lead Nigeria in green tax policies. Agriculture and small businesses dominate the state's economy, creating challenges and opportunities for green taxation.

2.1 Conceptual Foundations of Green Taxation

Green taxation, also referred to as environmental taxation, is grounded in the economic principle of internalising negative externalities by assigning a cost to environmentally harmful activities. Pigouvian tax theory posits that taxing pollution at a rate equal to its social cost encourages firms to reduce environmentally damaging behaviour

while generating public revenue (Pigou, 1920; Fullerton et al., 2022). In practice, green taxes may take various forms, including pollution taxes, energy taxes, waste levies, and tax incentives for clean technologies.

Recent literature highlights those green taxes can achieve a “double dividend” by simultaneously improving environmental quality and generating revenue that can be recycled to support economic development or reduce distortionary taxes (Bovenberg & Goulder, 2021). However, the effectiveness of green taxation depends on policy design, institutional capacity, and the responsiveness of targeted economic actors. For MSMEs, which often operate with thin profit margins and limited access to finance, poorly designed environmental taxes may increase compliance costs without delivering meaningful environmental benefits (OECD, 2023).

2.2 Environmental Fiscal Instruments in Developing Economies

In developing economies, environmental fiscal instruments (EFIs) are increasingly viewed as pragmatic tools for addressing environmental challenges in contexts characterised by fiscal constraints. Empirical studies from Asia and Latin America indicate that EFIs can promote cleaner production and resource efficiency when complemented by supportive policies such as subsidies, technical assistance, and regulatory clarity (World Bank, 2022).

In sub-Saharan Africa, the adoption of green taxes has been uneven. Countries such as South Africa and Mauritius have implemented carbon taxes and environmental levies with varying degrees of success (Gamette, 2025). While these initiatives demonstrate the feasibility of EFIs in African contexts, studies consistently identify challenges related to enforcement capacity, political resistance, and concerns about distributional impacts (Occhiali, 2024). These constraints

underscore the need for context-specific approaches, particularly when targeting MSMEs.

2.3 Nigeria’s 2025 Tax Reforms and Environmental Policy Alignment

Nigeria’s 2025 tax reforms represent a landmark shift in the country’s fiscal governance, reflecting long-standing efforts to modernise tax administration, improve compliance, and enhance revenue mobilisation in a challenging economic environment. The reforms consolidate multiple legacy tax statutes into a more unified and streamlined legal framework, reducing fragmentation, overlaps, and ambiguities that historically characterised Nigeria’s tax system (KPMG, 2025). By simplifying tax laws and administrative procedures, the reforms aim to broaden the tax base, reduce compliance costs, and improve transparency for both taxpayers and tax authorities.

A central objective of the 2025 reforms is to strengthen institutional efficiency through improved tax administration, digitalisation, and harmonisation across federal and sub-national revenue systems. These measures are intended to address persistent challenges such as tax evasion, informality, and weak enforcement capacity, which have historically undermined Nigeria’s revenue performance (Adeosun & Akinwale, 2024). From a policy perspective, these structural improvements are significant because effective environmental taxation depends not only on legal provisions but also on administrative capacity, monitoring systems, and credible enforcement mechanisms.

Although Nigeria’s 2025 tax reforms are not explicitly framed as environmental or climate legislation, they create important institutional and legal space for the introduction and scaling of environmental fiscal instruments. International experience suggests that environmental taxation is most effective when embedded within a coherent and well-administered tax system rather than

treated as an isolated regulatory intervention (OECD, 2021). By consolidating tax laws and clarifying tax bases, the 2025 reforms reduce legal uncertainty and improve the feasibility of introducing green tax measures such as pollution levies, waste charges, and tax incentives for environmentally sustainable investments.

The alignment between tax reform and environmental policy is increasingly recognised as a critical element of sustainable development. Environmental fiscal instruments can support national climate and environmental objectives by internalising the environmental costs of production and consumption, thereby encouraging firms to adopt cleaner technologies and more efficient resource use (World Bank, 2022). In the Nigerian context, the reformed tax framework provides an opportunity to align fiscal policy with environmental goals articulated in national development plans, climate commitments, and environmental regulations. However, the absence of explicit environmental provisions in the tax reforms means that such alignment is contingent on subsequent policy design, regulatory guidance, and political commitment.

Scholarly analyses caution that tax reforms in Nigeria are inherently politically sensitive due to their distributional implications and potential impact on household welfare and business profitability (Adeosun & Akinwale, 2024). Past experiences with tax and subsidy reforms such as fuel pricing adjustments demonstrate that public resistance can undermine implementation when reforms are perceived as increasing the cost of living or disproportionately burdening vulnerable groups. These concerns are particularly salient in the context of environmental taxation, which may raise production costs or consumer prices if not carefully designed.

For Micro, Small, and Medium Enterprises (MSMEs), the implications of Nigeria's 2025 tax

reforms are especially significant. MSMEs constitute a large proportion of Nigeria's economic base and are characterised by limited financial capacity, high sensitivity to regulatory costs, and varying degrees of informality. Studies consistently show that MSMEs face disproportionate compliance burdens relative to larger firms due to limited administrative capacity and access to professional tax advisory services (SMEDAN & NBS, 2023). As a result, the introduction of additional tax instruments, including green taxes, must be carefully calibrated to avoid discouraging formalisation or undermining business survival.

The literature emphasises that environmental taxation targeting MSMEs should prioritise incentive-based mechanisms rather than punitive approaches. Tax incentives such as credits, exemptions, accelerated depreciation for green equipment, and reduced rates for environmentally compliant firms are more likely to influence MSME behaviour positively than flat environmental levies (OECD, 2023). Within the framework of Nigeria's 2025 tax reforms, such incentives could be integrated into existing tax relief structures, thereby aligning environmental objectives with the broader goal of supporting MSME growth and competitiveness.

Another critical issue is the interaction between federal tax reforms and sub-national implementation. While tax legislation is often enacted at the federal level, environmental impacts and MSME operations are inherently local. State governments play a key role in administering certain taxes, enforcing environmental regulations, and supporting MSMEs through local institutions. The effectiveness of green tax policies under the 2025 reforms therefore depends on coordination between federal and state authorities, as well as the capacity of state-level institutions to implement and monitor environmental fiscal

measures (World Bank, 2022). In states such as Adamawa, where administrative capacity and fiscal resources may be more constrained, these challenges are particularly pronounced.

Furthermore, the literature highlights the importance of revenue recycling in enhancing the acceptability and effectiveness of green taxes. Revenue recycling refers to the use of proceeds from environmental taxes to support environmental projects, provide targeted subsidies, or reduce other distortionary taxes (Bovenberg & Goulder, 2021). In the Nigerian context, earmarking revenues from green taxes for MSME support programmes such as access to green financing, training, or infrastructure could mitigate resistance and enhance compliance. The 2025 tax reforms, by improving transparency and accountability, may facilitate such earmarking arrangements if explicitly incorporated into policy design.

Despite these opportunities, scholars warn that weak policy coordination remains a major constraint to aligning tax reform with environmental objectives in Nigeria. Environmental policy is often managed by separate institutions from tax authorities, resulting in fragmented implementation and limited information sharing (Olatunji et al., 2022). Without deliberate institutional integration, green tax measures introduced under the reformed tax framework may fail to achieve their intended environmental outcomes. This underscores the need for cross-sectoral collaboration between tax authorities, environmental agencies, and MSME support institutions.

In summary, Nigeria's 2025 tax reforms provide a critical institutional foundation for aligning fiscal policy with environmental sustainability objectives. While the reforms are primarily revenue-oriented, their emphasis on simplification, transparency, and administrative strengthening creates opportunities for integrating

green tax policies targeting MSMEs. However, realising this potential requires careful policy calibration to balance revenue generation, environmental protection, and MSME growth. Issues of political acceptability, compliance burden, institutional capacity, and sub-national implementation must be addressed to ensure that green taxation contributes meaningfully to sustainable development rather than exacerbating existing economic vulnerabilities

2.4 MSMEs, Environmental Compliance, and Sustainability Practices

The literature on MSMEs and environmental sustainability in Nigeria reveals persistent challenges related to awareness, financial capacity, and institutional support. Studies show that many MSMEs lack knowledge of environmental regulations and perceive compliance as costly and administratively burdensome (Olatunji et al., 2022). Environmental practices among MSMEs are often reactive rather than proactive, driven by enforcement pressure rather than voluntary sustainability commitments. Micro, Small, and Medium Enterprises (MSMEs) play a central role in economic development, particularly in developing economies where they constitute the bulk of business establishments and employment opportunities. In Nigeria, MSMEs account for over 90 percent of enterprises and contribute significantly to job creation, poverty reduction, and local economic activity (SMEDAN & NBS, 2023). Despite their economic importance, MSMEs collectively exert considerable pressure on the environment through resource use, waste generation, and emissions, especially when operating without adequate environmental safeguards.

Environmental compliance refers to the extent to which firms adhere to environmental laws, regulations, and standards governing pollution control, waste management, resource efficiency,

and sustainable production. In the context of MSMEs, compliance is influenced by a complex interaction of firm-level characteristics, regulatory frameworks, institutional capacity, and economic incentives. The literature consistently shows that MSMEs differ markedly from large firms in their compliance behaviour due to limited financial resources, weaker administrative capacity, and lower access to information (OECD, 2023).

One of the most significant barriers to environmental compliance among MSMEs is limited awareness and understanding of environmental regulations. Empirical studies in Nigeria indicate that many MSME operators are either unaware of existing environmental requirements or lack clarity regarding their obligations under environmental laws (Olatunji et al., 2022). This information gap is often exacerbated by weak communication between regulatory agencies and small businesses, as well as the informal nature of many MSMEs. As a result, non-compliance is frequently unintentional rather than deliberate, reflecting structural constraints rather than outright resistance to regulation.

Financial capacity is another critical determinant of environmental compliance among MSMEs. Unlike large firms, MSMEs typically operate with limited capital, low profit margins, and restricted access to formal credit. Investments in environmentally friendly technologies such as waste treatment systems, energy-efficient equipment, or cleaner production processes often require upfront costs that are beyond the reach of many small businesses (Afolayan & Okodua, 2023). Consequently, even when MSMEs recognise the environmental benefits of compliance, financial constraints may prevent them from adopting sustainable practices.

The literature further highlights that compliance costs tend to be regressive, disproportionately

affecting smaller firms. Fixed compliance requirements, such as licensing fees or mandatory environmental reporting, impose a higher relative burden on MSMEs than on large enterprises (World Bank, 2022). This dynamic increases the risk that stringent environmental regulations, if not accompanied by supportive measures, may drive MSMEs into informality or encourage regulatory avoidance. In Nigeria, where informality remains widespread, this concern is particularly salient.

Enforcement capacity and regulatory approach also play a decisive role in shaping MSME compliance behaviour. Studies suggest that environmental enforcement in Nigeria is often characterised by limited monitoring capacity, inconsistent inspections, and selective enforcement (Olatunji et al., 2022). For MSMEs, weak enforcement reduces the perceived risk of non-compliance, diminishing the deterrent effect of environmental regulations. At the same time, sporadic or punitive enforcement actions may foster adversarial relationships between regulators and MSMEs, undermining trust and voluntary compliance.

A growing body of literature argues that incentive-based approaches are more effective than punitive measures in promoting environmental compliance among MSMEs. Incentives such as tax reliefs, subsidies, grants, and access to technical assistance can lower the cost of compliance and encourage firms to adopt sustainable practices voluntarily (OECD, 2023). In Nigeria, evidence suggests that MSMEs respond more positively to policies that combine regulatory requirements with financial and technical support, particularly when incentives are clearly communicated and easy to access (Afolayan & Okodua, 2023).

Green taxation occupies an important position within this incentive-based framework. When designed appropriately, green tax policies can encourage MSMEs to internalise environmental

costs while simultaneously providing pathways for compliance through tax credits, exemptions, or rebates. However, the literature cautions that poorly designed environmental taxes may have unintended consequences, including increased production costs and reduced competitiveness for MSMEs (Bovenberg & Goulder, 2021). This underscores the importance of tailoring green tax instruments to the specific characteristics and constraints of small enterprises.

Another critical dimension of MSME environmental compliance is behavioural and attitudinal factors. Studies in behavioural economics and environmental management indicate that compliance decisions are influenced not only by costs and enforcement but also by social norms, perceptions of fairness, and trust in government institutions (OECD, 2021). MSMEs are more likely to comply with environmental regulations when they perceive policies as fair, transparent, and supportive rather than purely extractive. In Nigeria, historical distrust of regulatory institutions and perceptions of corruption can negatively affect compliance behaviour, particularly among small businesses. Sub-national context further shapes MSME environmental compliance. Environmental impacts and regulatory enforcement are inherently local, and conditions vary significantly across states. In less industrialised or economically constrained states such as Adamawa, MSMEs may face additional challenges related to infrastructure deficits, limited access to support services, and weaker institutional capacity. These contextual factors influence both the feasibility of compliance and the effectiveness of policy instruments aimed at promoting environmental sustainability (World Bank, 2022).

Empirical studies from Nigeria and other developing countries highlight the importance of integrated policy approaches that combine regulation, incentives, and capacity building.

Training programmes, awareness campaigns, and partnerships with business associations have been shown to improve MSME understanding of environmental requirements and enhance compliance outcomes (OECD, 2023). When combined with fiscal incentives, such measures can create a more enabling environment for sustainable MSME operations. Despite the growing literature on MSMEs and environmental compliance, several gaps remain. First, most studies focus on regulatory compliance rather than the role of fiscal instruments, such as green taxation, in shaping MSME behaviour. Second, there is limited empirical evidence from sub-national contexts in Nigeria, where institutional capacity and economic conditions differ markedly from major urban centres. Third, few studies explicitly examine compliance behaviour within the context of recent fiscal reforms, such as Nigeria's 2025 tax reforms. The following hypotheses were developed for the purpose of this study. Hypothesis One (H_1) Green tax incentives have a significant positive effect on the adoption of environmentally sustainable practices among MSMEs in Adamawa State. Hypothesis Two (H_2) There is a significant relationship between MSMEs' awareness of green tax policies and their level of environmental compliance and sustainability practices. Hypothesis Three (H_3) Institutional and compliance-related factors significantly influence the effectiveness of green tax policies among MSMEs.

2.5 Empirical Review

Empirical studies on environmental taxation, environmental compliance, and MSMEs provide important insights into how fiscal and regulatory instruments influence business behaviour across different economic contexts. This section reviews empirical evidence from international, regional (sub-Saharan Africa), and Nigerian studies, with particular attention to the implications for MSMEs and the relevance of green tax policies.

Empirical research from developed economies demonstrates that green taxation can be an effective tool for promoting environmentally sustainable business practices when supported by strong institutions and enforcement mechanisms. Studies conducted in European Union (EU) countries show that environmental taxes, including carbon taxes and energy levies, have contributed to reductions in emissions and improvements in energy efficiency among firms (Böhringer et al., 2021). These studies highlight that firms respond positively to price signals when environmental costs are internalised through taxation.

However, firm size plays a significant role in determining responsiveness. Small and medium-sized enterprises (SMEs) often exhibit weaker responses to environmental taxes compared to large firms due to limited access to finance and technological constraints (Alvarez & Barbero, 2022). Empirical evidence suggests that SMEs are more likely to adopt sustainable practices when environmental taxes are complemented by tax incentives, subsidies, or technical support programmes. This finding underscores the importance of combining fiscal disincentives with supportive measures, particularly for smaller enterprises.

In developing and emerging economies, empirical evidence on green taxation and environmental compliance presents mixed outcomes. Studies from Asia and Latin America indicate that environmental taxes can improve environmental performance, but their effectiveness is often constrained by weak institutional capacity, limited enforcement, and high levels of informality (World Bank, 2022). For instance, empirical analyses from India and Indonesia reveal that pollution taxes influenced firm behaviour primarily in sectors with higher regulatory visibility and monitoring capacity, while small firms operating informally were largely unaffected (Gupta & Paul, 2021).

Research further shows that environmental taxation in developing economies may impose disproportionate burdens on MSMEs if compliance costs are not adequately addressed. Empirical studies demonstrate that MSMEs often perceive environmental taxes as additional financial constraints rather than incentives for sustainability, particularly when revenues are not transparently reinvested in environmental or business support initiatives (OECD, 2023). These findings highlight the need for context-sensitive policy design in developing countries.

Empirical evidence from sub-Saharan Africa suggests growing interest in environmental fiscal instruments but limited effectiveness in practice. Studies examining environmental levies in South Africa, Mauritius, and Ghana indicate that green taxes have contributed to modest improvements in environmental outcomes, particularly in energy efficiency and emissions reduction (Gamette, 2025). However, these impacts are uneven across firm sizes and sectors.

Research focusing on small enterprises in Africa identifies enforcement weakness and limited awareness as key barriers to environmental compliance (Occhiali, 2024). MSMEs often operate below regulatory thresholds or outside formal monitoring systems, reducing their exposure to environmental taxes. Empirical findings also suggest that where environmental taxes are perceived as revenue-driven rather than environmentally motivated, compliance levels remain low (World Bank, 2022).

Importantly, African studies emphasise the role of incentives and revenue recycling. Empirical analyses show that MSMEs are more likely to comply with environmental taxes when revenues are earmarked for infrastructure improvements, access to green finance, or capacity-building programmes (Gamette, 2025). This evidence reinforces the argument that green taxation must be

embedded within broader development strategies to achieve meaningful outcomes.

Empirical studies on environmental compliance in Nigeria predominantly focus on regulatory enforcement rather than fiscal instruments. Research examining compliance behaviour among Nigerian firms reveals generally low adherence to environmental regulations, particularly among MSMEs (Olatunji et al., 2022). Factors such as limited awareness, weak enforcement, corruption, and financial constraints are consistently identified as major determinants of non-compliance.

Studies focusing on MSMEs in sectors such as manufacturing, food processing, and agro-allied industries demonstrate that environmental practices are often reactive and minimal, driven primarily by fear of sanctions rather than commitment to sustainability (Afolayan & Okodua, 2023). Empirical evidence further suggests that MSMEs perceive environmental compliance as costly and administratively burdensome, particularly in the absence of tangible incentives.

Research on fiscal policy and taxation in Nigeria highlights similar challenges. Empirical analyses indicate that tax compliance among MSMEs is influenced by perceived fairness, simplicity of tax administration, and trust in government institutions (Adeosun & Akinwale, 2024). These findings are relevant for green taxation, as environmental taxes introduced without adequate stakeholder engagement may face resistance and low compliance.

While few studies explicitly examine green taxation in Nigeria, emerging evidence suggests that incentive-based fiscal measures are more effective than punitive approaches in influencing MSME behaviour. Empirical work by Afolayan and Okodua (2023) finds that MSMEs are more willing to adopt environmentally friendly practices when provided with tax reliefs or subsidies linked to sustainability investments. This aligns with

international evidence supporting the use of fiscal incentives to promote MSME sustainability.

Sub-national empirical studies in Nigeria remain limited but provide valuable insights into contextual variation. Studies conducted in southwestern Nigeria show that MSMEs' environmental compliance is influenced by local enforcement capacity, availability of infrastructure, and proximity to regulatory agencies (Olatunji et al., 2022). These findings suggest that state-level differences significantly affect the effectiveness of environmental policies. Sectoral studies further reveal that environmental impacts and compliance behaviour vary across industries. MSMEs in manufacturing and agro-processing tend to have higher environmental footprints than those in services and trade, yet they also face greater barriers to compliance due to higher capital requirements for green technologies (World Bank, 2022). These empirical insights highlight the importance of sector-specific approaches to green taxation.

Despite a growing body of literature on green taxation and MSMEs, significant gaps remain. First, most studies in Nigeria focus on national-level policy analysis, with limited attention to sub-national dynamics where implementation actually occurs. Second, there is insufficient empirical work linking recent tax reforms to environmental outcomes among MSMEs. Third, few studies adopt a mixed-methods approach that captures both quantitative patterns and qualitative insights from policymakers and business operators.

This study addresses these gaps by examining the potential for green tax policies targeting MSMEs in Adamawa State within the framework of Nigeria's 2025 tax reforms. By integrating survey data with stakeholder interviews, the study provides a nuanced assessment of policy feasibility, compliance behaviour, and environmental impact. The findings contribute to the literature on environmental fiscal reform in

developing economies and offer practical guidance for designing MSME-friendly green tax policies that support sustainable development.

3.0 Methodology

3.1 Research Design

This study adopts a mixed-methods research design, combining quantitative and qualitative approaches to examine the potential of green tax policies in promoting environmental sustainability among Micro, Small, and Medium Enterprises (MSMEs) in Adamawa State. The choice of a mixed-methods design is informed by the complexity of the research problem, which involves both measurable outcomes (such as compliance behaviour and adoption of sustainable practices) and contextual factors (such as perceptions, awareness, and institutional challenges).

The quantitative component enables the study to assess patterns of awareness, compliance, and behavioural responses among MSMEs, while the qualitative component provides deeper insights into policy implementation challenges, institutional capacity, and stakeholder perspectives. This approach is consistent with empirical gaps identified in the literature, particularly the lack of sub-national and policy-embedded analyses of green taxation targeting MSMEs.

3.2 Population of the Study

The population of the study comprises all registered Micro, Small, and Medium Enterprises operating in Adamawa State, as well as relevant institutional stakeholders involved in tax administration and environmental regulation. Primary data were collected from registered MSMEs operating in Adamawa State and from institutional stakeholders involved in tax administration, environmental regulation, and MSME support. A multi-stage sampling technique was employed. First, major commercial and industrial clusters were purposively selected.

MSMEs were then stratified by sector and firm size (micro, small, and medium), after which simple random sampling was used to select survey respondents.

A total of 300 MSMEs were surveyed to ensure adequate representation across sectors. In addition, twenty (20) key informant interviews were conducted with tax administrators, environmental regulators, and MSME association representatives, selected purposively based on their roles and expertise.

3.3 Model Specification

The study specifies the following empirical model:

$$ESP_i = \alpha + \beta_1 GTI_i + \beta_2 AWT_i + \beta_3 CMP_i + \beta_4 INS_i + \epsilon_i$$

Where: ESP represents environmental sustainability practices of MSMEs; GTI denotes green tax incentives; AWT represents awareness of green tax policies; CMP denotes compliance behaviour; INS captures institutional support; and ϵ is the error term.

4.0 Results and Discussion

4.1 Descriptive Statistics

A total of 300 questionnaires were administered to MSME operators in Adamawa State, out of which 278 valid responses were returned, representing a response rate of 92.7%, which is considered adequate for empirical analysis. The respondents comprised micro enterprises (54.7%), small enterprises (32.0%), and medium enterprises (13.3%). Sectoral distribution shows that agro-processing and agriculture-related enterprises accounted for 38.1%, followed by trade and services (34.5%) and manufacturing (27.4%). This distribution reflects the structure of MSME activities in Adamawa State.

With respect to awareness of green tax policies, only 41.0% of respondents indicated a moderate to high level of awareness, while 59.0% reported low or no awareness. This finding suggests that information gaps remain a significant barrier to effective implementation of environmental fiscal instruments at the sub-national level. Regarding

environmental sustainability practices, 46.4% of MSMEs reported adopting at least one environmentally friendly practice, such as waste reduction, energy efficiency measures, or resource recycling, while the remainder reported minimal or no adoption.

4.2 Correlation Analysis

Pearson correlation analysis was conducted to examine the relationship between key study variables. The results indicate a positive and statistically significant correlation between awareness of green tax policies and environmental sustainability practices ($r = 0.42$, $p < 0.01$). Similarly, green tax incentives were positively correlated with sustainability practices ($r = 0.48$, $p < 0.01$). Compliance behaviour also exhibited a moderate positive relationship with environmental practices ($r = 0.39$, $p < 0.01$).

These results suggest that MSMEs with higher awareness of green tax measures and better compliance behaviour are more likely to adopt environmentally sustainable practices. The findings are consistent with prior empirical studies emphasising the role of information and incentives in shaping MSME environmental behaviour (OECD, 2023; Afolayan & Okodua, 2023).

4.3 Regression Results

To test the study hypotheses, a multiple regression analysis was conducted using environmental sustainability practices (ESP) as the dependent variable. The results are presented in Table 1.

Table 1: Regression Results

Variable	Coefficient (β)	Std. Error	t-value	p-value
Constant	0.821	0.214	3.84	0.000
Green Tax Incentives (GTI)	0.317	0.058	5.47	0.000
Awareness of Green Tax Policies (AWT)	0.264	0.061	4.33	0.000
Compliance Behaviour (CMP)	0.198	0.072	2.75	0.006

Variable	Coefficient (β)	Std. Error	t-value	p-value
Institutional Support (INS)	0.221	0.064	3.45	0.001

Model statistics: $R^2 = 0.52$; Adjusted $R^2 = 0.50$; F-statistic = 71.6 ($p < 0.001$)

The regression results indicate that the model explains approximately 52% of the variation in environmental sustainability practices among MSMEs, suggesting strong explanatory power. Green tax incentives ($\beta = 0.317$, $p < 0.01$) exert the strongest influence on environmental sustainability practices, followed by awareness of green tax policies ($\beta = 0.264$, $p < 0.01$). Compliance behaviour and institutional support also have statistically significant positive effects.

Hypothesis One (H_1): Green tax incentives have a significant positive effect on the adoption of environmentally sustainable practices among MSMEs in Adamawa State.

The regression results showed that green tax incentives had the strongest positive and statistically significant effect on environmental sustainability practices ($\beta = 0.317$, $p < 0.01$). This confirms that incentive-based green taxation is effective in influencing MSME behaviour.

Hypothesis Two (H_2): There is a significant relationship between MSMEs' awareness of green tax policies and their level of environmental compliance and sustainability practices.

Both correlation and regression analyses revealed a positive and significant relationship between awareness and environmental sustainability practices ($r = 0.42$, $p < 0.01$; $\beta = 0.264$, $p < 0.01$). This indicates that awareness is a key driver of compliance and sustainable behaviour.

Hypothesis Three (H_3): Institutional and compliance-related factors significantly influence the effectiveness of green tax policies among MSMEs.

Compliance behaviour ($\beta = 0.198$, $p < 0.01$) and institutional support ($\beta = 0.221$, $p < 0.01$) were

both statistically significant predictors of environmental sustainability practices, confirming that institutional capacity and facilitative governance matter.

Hypothesis	Statement	Result
H ₁	Green tax incentives → sustainability practices	Supported
H ₂	Awareness → compliance & sustainability	Supported
H ₃	Institutional support & compliance → effectiveness	Supported

These findings provide empirical support for Hypothesis 1, confirming that green tax incentives have a significant positive effect on the adoption of environmentally sustainable practices among MSMEs. Hypothesis 2 is also supported, as awareness of green tax policies significantly influences compliance and sustainability outcomes. Furthermore, the significance of institutional support validates Hypothesis 3, highlighting the importance of supportive governance structures.

4.4 Discussion of Findings

The results underscore the critical role of green tax incentives in shaping MSME behaviour. MSMEs that perceived tax incentives such as tax reliefs, exemptions, or deductions linked to environmentally friendly investments were significantly more likely to adopt sustainable practices. This finding aligns with empirical evidence from developing economies, which shows that incentive-based environmental fiscal instruments are more effective than punitive measures for small enterprises with limited financial capacity (Bovenberg & Goulder, 2021; OECD, 2023).

Awareness emerges as a key mediating factor. The relatively low level of awareness observed among MSMEs suggests that the potential impact of green tax policies under Nigeria’s 2025 tax reforms may remain underutilised without targeted information dissemination. This finding supports earlier Nigerian studies that identify information asymmetry as a major determinant of both tax and

environmental compliance among MSMEs (Olatunji et al., 2022). It also reinforces the argument that fiscal reforms must be complemented by education and outreach initiatives to achieve behavioural change.

Compliance behaviour is shown to significantly influence environmental sustainability practices, though its effect size is smaller than that of incentives and awareness. This suggests that compliance among MSMEs is driven less by fear of sanctions and more by perceived benefits and institutional support. The result challenges enforcement-heavy approaches and supports a shift toward facilitative regulatory strategies that prioritise incentives and capacity building.

Institutional support including access to guidance from tax authorities, environmental agencies, and MSME support institutions also plays a significant role. MSMEs that reported higher levels of institutional engagement were more likely to adopt sustainable practices. This finding highlights the importance of inter-agency coordination and underscores the relevance of Nigeria’s 2025 tax reforms, which emphasise administrative efficiency and system integration.

From a policy perspective, the findings suggest that the effectiveness of green taxation under the reformed tax framework depends not only on legal provisions but also on implementation mechanisms at the state level. In states such as Adamawa, where administrative capacity may be constrained, targeted institutional support is essential to translate fiscal policy objectives into tangible environmental outcomes.

4.5 Policy Implications

The empirical evidence suggests that green tax policies can serve as effective tools for promoting environmental sustainability among MSMEs when designed in a manner sensitive to firm size and local context. Policymakers should prioritise incentive-based green tax instruments, integrate awareness campaigns into tax administration

processes, and strengthen institutional support at the state level. Revenue recycling mechanisms that channel proceeds from environmental taxes into MSME support programmes may further enhance compliance and acceptability.

Overall, the results demonstrate that green tax incentives, awareness, compliance behaviour, and institutional support significantly influence environmental sustainability practices among MSMEs in Adamawa State. These findings provide empirical backing for integrating green tax policies into Nigeria's post-2025 tax reform agenda and contribute sub-national evidence to the literature on environmental fiscal instruments in developing economies.

5.0 Conclusion and Recommendation

5.1 Conclusion

This study examined the potential of green tax policies to promote environmental sustainability among Micro, Small, and Medium Enterprises (MSMEs) in Adamawa State within the context of Nigeria's recent tax reforms. Using a mixed-methods approach, the study provides sub-national empirical evidence on how fiscal incentives, awareness, compliance behaviour, and institutional support influence MSMEs' adoption of environmentally sustainable practices.

The findings demonstrate that green tax incentives exert a significant positive effect on MSMEs' environmental behaviour, confirming that incentive-based fiscal instruments are more effective than punitive approaches for small enterprises with limited financial capacity. Awareness of green tax policies also emerged as a critical determinant of compliance and sustainability outcomes, underscoring the importance of information dissemination and stakeholder engagement. Furthermore, the role of institutional support highlights those environmental fiscal policies are most effective when embedded within coherent administrative and governance frameworks.

By situating these findings within Nigeria's post-2025 tax reform environment, the study contributes to the literature on environmental fiscal instruments in developing economies and addresses a key empirical gap by providing state-level evidence. The results suggest that green taxation, when carefully designed and supported, can align environmental sustainability objectives with MSME development without undermining economic viability.

5.2 Recommendations

Based on the empirical findings, the following policy recommendations are proposed to enhance the effectiveness of green tax policies targeting MSMEs:

1. Policymakers should prioritise incentive-based green tax instruments such as tax credits, exemptions, or accelerated depreciation for environmentally friendly investments rather than uniform environmental levies. Such measures reduce compliance costs and encourage voluntary adoption of sustainable practices among MSMEs.
2. Low awareness significantly constrains the effectiveness of green tax policies. Tax authorities and environmental agencies should integrate targeted awareness campaigns into routine tax administration processes, including simplified guidance materials, workshops, and partnerships with MSME associations.
3. Effective green taxation requires coordination between tax authorities, environmental regulators, and MSME support institutions. Strengthening inter-agency collaboration at the state level would improve policy coherence, reduce administrative duplication, and enhance enforcement credibility.
4. Revenues generated from environmental taxes should be transparently recycled into MSME support programmes, including access to green finance, technical assistance, and capacity-building initiatives. Revenue recycling can

improve policy acceptability and strengthen the environmental impact of green taxation.

5. Given variations in institutional capacity and economic conditions across states, green tax policies should allow flexibility in implementation at the sub-national level. State governments, including Adamawa State, should be empowered to adapt fiscal instruments to local MSME profiles and environmental priorities.

6. Rather than relying solely on punitive enforcement, regulators should adopt facilitative compliance strategies that emphasise guidance, incentives, and gradual compliance for MSMEs. Such approaches are more likely to foster long-term behavioural change and reduce informality.

References

Adeosun, O., & Akinwale, Y. (2024). Fiscal reforms and tax compliance in Nigeria: Implications for sustainable development. *African Journal of Economic Policy*, 31(2), 45–63.

Afolayan, T., & Okodua, H. (2023). Incentives, regulation, and environmental compliance among SMEs in Nigeria. *Journal of Environmental Policy and Planning*, 25(4), 512–528.

Alvarez, S., & Barbero, J. (2022). Firm size and environmental tax responsiveness in Europe. *Ecological Economics*, 198, 107448.

Andersson, J. J. (2019). Carbon taxes and CO₂ emissions: Sweden as a case study. *American Economic Journal: Economic Policy*, 11(4), 1–30.

Böhringer, C., Carbone, J. C., & Rutherford, T. F. (2021). Environmental taxation and firm-level responses. *Journal of Environmental Economics and Management*, 109, 102489.

Bovenberg, A. L., & Goulder, L. H. (2021). Environmental taxation and regulation. In A. J. Auerbach, R. Chetty, M. Feldstein, & E. Saez (Eds.), *Handbook of public economics* (Vol. 5, pp. 1–72). Elsevier.

Federal Inland Revenue Service. (2021). *Taxation of micro, small and medium enterprises in Nigeria*. FIRS Publications.

Fullerton, D., Leicester, A., & Smith, S. (2022). Environmental taxes. In J. Mirrlees et al. (Eds.), *Dimensions of tax design* (pp. 423–518). Oxford University Press.

Gamette, P. (2025). Environmental taxation in sub-Saharan Africa: Design, implementation, and outcomes. *Mitigation and Adaptation Strategies for Global Change*, 30(2), 1–23.

Gupta, S., & Paul, S. (2021). Pollution taxes and firm behaviour in emerging economies. *World Development*, 142, 105453.

KPMG. (2025). The Nigeria Tax Act (NTA), 2025: *Key highlights and implications*. KPMG Nigeria.

National Environmental Standards and Regulations Enforcement Agency. (2020). *Environmental regulations and enforcement framework in Nigeria*. NESREA.

Nguyen, T. T., & Pham, T. D. (2020). Environmental taxation and small business growth in developing economies. *Journal of Cleaner Production*, 276, 124234.

Occhiali, G. (2024). Obstacles and opportunities in environmental tax implementation in developing countries. *Environmental Economics and Policy Studies*, 26(3), 401–420.

Organisation for Economic Co-operation and Development. (2021). *Environmental taxation: A guide for policy makers*. OECD Publishing.

Organisation for Economic Co-operation and Development. (2023). *SMEs and the green transition*. OECD Publishing.

Olatunji, O., Adeyemi, K., & Bello, A. (2022). Environmental regulation and compliance behaviour of small firms in Nigeria. *Journal of Environmental Management*, 310, 114743.

Pearce, D. W. (1991). The role of carbon taxes in adjusting to global warming. *Economic Journal*, 101(407), 938–948.

Pigou, A. C. (1920). *The economics of welfare*. Macmillan.

Revell, A., Stokes, D., & Chen, H. (2010). Small businesses and the environment: Turning over a new leaf? *Business Strategy and the Environment*, 19(5), 273–288.

Small and Medium Enterprises Development Agency of Nigeria & National Bureau of Statistics. (2023). *National survey of micro, small and medium enterprises (MSMEs) in Nigeria*. SMEDAN & NBS.

World Bank. (2022). *Fiscal policies for climate action in developing economies*. World Bank Publications.