Available online at: http://journal.uinsgd.ac.id/index.php/ks
Khazanah Sosial, Vol. 7 No. 2: 524-538

DOI: 10.15575/ks.v7i3.39345

The Moderating Role of Green Budget Tagging on Budgeting Practices and Fiscal Policy Sustainability in Ghana's Local Government

Shaibu Awudu[1*], Nugraha[2], Chairul Furqon[3], Maya Sari[4], Ayu Krishna Yuliawati[5]
[1]Local Government Service, Ghana
[1-5]Universitas Pendidikan Indonesia, Indonesia
*Corresponding Author E-mail: shaibuawudu@upi.edu

Abstract

This study investigates how green budget tagging moderates the relationship between Green Budgeting Practices and fiscal policy sustainability in Metropolitan, Municipal, and District Assemblies (MMDAs). Using a quantitative research approach and multiple regression analysis, the study examines how Green Budget Practices influence Fiscal Policy Sustainability. Key findings reveal that while Climate Change Adaptation and Mitigation, Waste Management, Renewable Energy Development, and Natural Resource Conservation positively impact Fiscal Policy Sustainability, Sustainable transport does not directly affect fiscal policy sustainability. Moreover, Green budget labelling interacts negatively with Budget Practices and Fiscal Policy Sustainability. Net impacts indicate that environmental issues still support fiscal policy sustainability. Policymakers must address the issue of how green budget labelling has inadvertently harmed significant environmentally sustainable activities, and diligently design and implement a green budget labelling framework that balances ecological objectives with economic prudence. To ensure that environmental initiatives do not inadvertently compromise fiscal sustainability, they should also enhance communication between the departments responsible for environmental and fiscal policy management. This study makes a significant contribution to the implications of green budget labelling in Ghana. It provides policymakers with critical information regarding the impact of green budgeting on fiscal policy and offers recommendations for its implementation. This research addresses a gap in the literature, contributes to the growing discourse on sustainable fiscal policies, and offers a practical framework for other local governments to emulate more effectively align their environmental issues and economic objectives.

Keywords: Green budget practices; green budget tagging; sustainable fiscal policy.

Abstrak

Penelitian ini menyelidiki bagaimana *green budget tagging* memoderasi hubungan antara praktik *green budgeting* dan keberlanjutan kebijakan fiskal pada Metropolitan, Municipal, and District Assemblies (MMDAs). Dengan menggunakan pendekatan penelitian kuantitatif dan analisis regresi berganda, penelitian ini mengkaji bagaimana praktik *green budgeting* memengaruhi keberlanjutan kebijakan fiskal. Temuan utama menunjukkan bahwa Adaptasi dan Mitigasi Perubahan Iklim, Pengelolaan Limbah, Pengembangan Energi Terbarukan, dan Konservasi Sumber Daya Alam berpengaruh positif terhadap keberlanjutan kebijakan fiskal, sementara transportasi berkelanjutan tidak secara langsung memengaruhi keberlanjutan fiskal. Lebih jauh, *green budget labelling* berinteraksi secara negatif dengan praktik anggaran dan keberlanjutan kebijakan fiskal. Dampak bersih menunjukkan bahwa isu lingkungan tetap mendukung keberlanjutan kebijakan fiskal. Pembuat kebijakan harus menangani masalah bagaimana *green budget labelling* secara tidak sengaja merugikan kegiatan lingkungan berkelanjutan yang signifikan, serta secara cermat merancang dan mengimplementasikan kerangka kerja *green budget labelling* yang menyeimbangkan tujuan ekologis dengan kehati-hatian ekonomi. Untuk memastikan bahwa inisiatif lingkungan tidak secara tidak sengaja mengorbankan keberlanjutan fiskal, komunikasi antara departemen yang bertanggung jawab atas kebijakan lingkungan dan fiskal juga perlu ditingkatkan. Penelitian ini memberikan kontribusi signifikan terhadap pemahaman mengenai implikasi *green budget labelling* di Ghana. Hasil penelitian ini menyediakan informasi penting bagi para pembuat kebijakan mengenai dampak *green budgeting* terhadap kebijakan fiskal dan menawarkan rekomendasi untuk implementasinya. Penelitian ini mengisi kesenjangan dalam literatur, memperkaya diskursus tentang

Received: September 19, 2024; Revised: October 6, 2024; Accepted: February 2, 2025

kebijakan fiskal berkelanjutan, serta menawarkan kerangka praktis bagi pemerintah daerah lain untuk mencontoh dalam menyelaraskan isu lingkungan dan tujuan ekonomi secara lebih efektif.

Kata Kunci: praktik *green budgeting*; *green budget tagging*; kebijakan fiskal berkelanjutan.

INTRODUCTION

In the past decade, issues such as climate change, natural resource degradation, and waste management have emerged as critical global phenomena, affecting economic stability, public health, and overall quality of life (Vojnovic, 2014). Reports from the IPCC indicate that the impacts of extreme climate events are placing increasing pressure on developing countries to integrate green practices into their fiscal policies. In Ghana, these challenges are evident within the Metropolitan, Municipal, and District Assemblies (MMDAs), which continue to struggle with the adoption of green budget labeling. Limited institutional capacity, bureaucratic inefficiencies, and weak cross-sector collaboration have caused numerous environmentally friendly projects to be delayed or poorly executed, including waste management programs, sustainable transportation initiatives, and climate change adaptation efforts (Bilal, 2019; Fobih, 2020; Seah & Addo-Fordwuor, 2021).

This phenomenon warrants critical analysis because it highlights the direct interconnection between fiscal sustainability and environmental sustainability. When environmental factors are excluded from budgetary planning, the long-term risks—such as increased debt burdens resulting from climate-related disasters—become more pronounced. Conversely, green budgeting expands traditional fiscal concepts by incorporating transparency, accountability, and ecological considerations into public policy (Petrie, 2021). Empirical evidence demonstrates that effective waste management, renewable energy development, and sustainable transportation not only safeguard the environment but also generate significant economic benefits (Lu, Long, & Yuan, 2023; Sari et al., 2022). Nevertheless, a research gap remains regarding how green budget tagging moderates the relationship between long-term fiscal policy and environmental sustainability, particularly at the local government level in Ghana (Alare, Lawson, Mensah, Yevide, & Adiku, 2022).

Previous studies on the relationship between fiscal policy and environmental sustainability can be grouped into three main categories. First, research on climate change adaptation and mitigation emphasizes the urgency of implementing proactive strategies to reduce climate impacts on economic stability (Alare et al., 2022; Pendergrass, Sampson, Walsh, & Alagna, 2019). These studies show that adaptation measures and the reduction of greenhouse gas emissions can strengthen long-term fiscal resilience, but they have not extensively examined their application at the local government level. Second, studies on waste management and renewable energy highlight their contribution to both fiscal and environmental sustainability. Awuah-Offei et al. (2021) demonstrate that efficient waste management systems and renewable energy development have positive implications for economic growth and fiscal stability. However, most of this research has analyzed these aspects in isolation rather than within an integrated fiscal framework. Third, research on sustainable transportation and natural resource conservation (Hurlimann, Moosavi, & Browne, 2021; Nieuwenhuijsen, 2020) underscores the importance of environmentally friendly mobility and resource management as key factors supporting long-term fiscal stability. Nevertheless, these studies generally stop at analyzing environmental and economic benefits without considering how fiscal instruments might directly reinforce these relationships.

Across these three categories, a clear research gap emerges in understanding how green budget labeling functions as a moderating variable. While the existing literature indicates that climate adaptation,

waste management, renewable energy, sustainable transportation, and natural resource conservation are linked to fiscal sustainability, relatively few studies have comprehensively examined how green budget tagging can strengthen these relationships—particularly in the context of the Metropolitan, Municipal, and District Assemblies (MMDAs) in Ghana. This gap highlights the need for further research to investigate the role of green budget tagging in clarifying the mechanisms by which environmental factors can be integrated into local fiscal policy.

This study aims to analyze the influence of environmental initiatives—such as climate change adaptation and mitigation, waste management, renewable energy development, sustainable transportation, and natural resource conservation—on the fiscal policy sustainability of MMDAs in Ghana, as well as to assess how green budget labeling moderates these relationships. In doing so, the study contributes to the literature on sustainable fiscal policy and provides practical insights for policymakers in designing budget strategies that are both environmentally friendly and economically stable.

Building on the literature review and the identified research gap, this study argues that green budget labeling has the potential to strengthen the relationship between environmental factors and fiscal policy sustainability. More specifically, it posits that climate change adaptation and mitigation will have a positive effect on fiscal sustainability by reducing long-term risks associated with climate-related disasters. Similarly, effective waste management practices are expected to significantly contribute to fiscal stability while simultaneously ensuring environmental preservation. Renewable energy development is also assumed to have a positive correlation with fiscal sustainability, as it can enhance energy security and reduce reliance on fossil fuels. Furthermore, sustainable transportation initiatives are believed to generate positive impacts by improving cost efficiency, enhancing air quality, and reducing carbon emissions. In addition, natural resource conservation is projected to be closely linked to fiscal sustainability, as it ensures the availability of environmental assets that underpin long-term economic stability. Ultimately, green budget labeling is hypothesized to serve as a moderating variable that strengthens the overall relationship between these environmental initiatives and fiscal policy sustainability, thereby underscoring the importance of integrating a green perspective into public budgeting frameworks.

Overall, the theoretical framework of this study integrates Public Choice Theory, Institutional Theory, and Resource Dependence Theory to explain the relationship between fiscal policy and environmental sustainability through the practice of green budget labeling in Ghana. Public Choice Theory emphasizes how decision-making within MMDAs is often influenced by political interests and individual preferences, suggesting that the integration of environmental factors into budgeting requires a clear understanding of the motivations and orientations of public officials (Buchanan & Tullock, 2003). Institutional Theory, meanwhile, highlights the role of formal rules, regulations, and organizational norms in shaping institutional behavior, which in this context explains the extent to which policy structures enable MMDAs to adopt green budget labeling practices (Meyer & Rowan, 1977; North, 1990). Resource Dependence Theory further underscores the reliance of MMDAs on external resources and the importance of budget management strategies to ensure the continuity of environmental programs, with green budget labeling serving as an instrument to optimize resource allocation (Goodrick & Salancik, 1996; Pfeffer, 1987). Taken together, these three theories provide a comprehensive analytical framework for understanding how political motivations, institutional dynamics, and resource dependencies interact to influence the effectiveness of green budget labeling in promoting both fiscal and environmental sustainability.

RESEARCH METHODS

 ISSN 2715-8071 (online)

The study employed a quantitative approach and descriptive survey design to investigate the moderating effect of green budget tagging on the relationship between green budgeting practices and fiscal policy. We used the quantitative approach to test the hypothesis about the long-term sustainability of fiscal policies and explore correlations, as it generates quantifiable and statistically significant data. It was imperative to document the current state of green budgeting practices across all MMDAs to gain a comprehensive understanding of the differences between regions and assembly sizes. The population for this analysis comprised all 261 MMDAs in Ghana (Ghana Statistical Service, 2021). MMDAs were used in the analysis because of their significant influence on the lower level of local governance in Ghana. Their incorporation was facilitated by their responsibilities in the allocation of funds, the formulation of fiscal policy, and the implementation of environmental initiatives.

Using the formula for determining the sample size for a finite population, the researchers determined the sample size to be 156. The following formula was applied:

$$n = (Z^2 * p * q)/(\frac{d^2}{N} + z^2 * p * q),$$

Where n represents the sample size. Z = Z-value for the desired confidence level p = the estimated proportion of the population that possesses the characteristic of interest q = 1 - p d = level of precision desired N = population quantity. To ensure that the 156 MMDAs were representative, they were selected using simple random sampling, where each MMDA had an equal chance of being included in the sample. This sampling strategy reduced bias and ensured that each MMDA had an equal opportunity to participate in the study (Fricker, 2008). Based on predetermined criteria, we selected three individuals from each MMDA. Participants were selected based on their demonstrated proficiency in budgetary administration and the implementation of environmental policies. Individuals were selected based on their level of seniority, involvement in environmental or fiscal policy initiatives within their respective assembly, and expertise in budgeting. We achieved a thorough understanding of green budget labelling procedures within the MMDA organization by incorporating key officials from departments such as Finance, Environment, and Planning. By employing this approach, we ensured that our experts could illuminate how green budgeting impacts long-term budgetary viability.

Three participants were selected from each MMDA for the study, resulting in the distribution of 468 (3*156) questionnaires across the nation. The questionnaires were divided into two sections under the objectives of the study. The first section focussed on fiscal policy sustainability variables, green budget labelling, and green budgeting practices. The second section of the survey gathered demographic information about respondents and MMDAs. A pilot study with 30 participants was conducted to ensure the reliability and validity of the research instruments. Each variable's Cronbach's alpha coefficient was calculated, and adjustments were made to improve the questionnaire items' internal consistency (Hair, Risher, & Ringle, 2019). To further ensure reliability questionnaires were verified by calculating Cronbach's alpha coefficients for each construct it examined. Cronbach's alpha is a frequently employed statistic for testing the internal consistency of items to ensure that they consistently measure the same underlying concept. The reliability analysis demonstrated that the instruments were reliable, as Cronbach's alpha values for all constructs ranged from strong to acceptable. For example, Cronbach's alpha values of the other environmental indicators, fiscal policy sustainability (0.946), and green budget labelling (0.827), were all greater than the generally accepted criterion of 0.7, suggesting a high level of internal consistency. We revised the questionnaire's items that did not meet the reliability criteria during the pilot phase to enhance their clarity and consistency.

The dependent variable, fiscal policy sustainability, was measured using statements such as "The fiscal policies implemented by our MMDA effectively balance short-term needs with the long-term viability

of our finances." Previous studies on the sustainability of fiscal policy employed comparable metrics (Narayana, 2016). The moderating variable, green budget tagging, was measured with statements such as "The MMDA effectively identifies and tags budget allocations specifically for green initiatives." Previous studies investigating the impact of green budget tagging employed comparable methods (Pindiriri & Kwaramba, 2024). The independent variables, including adaptation to and mitigation of climate change, waste management, renewable energy development, sustainable transport, and natural resource conservation, were measured using statements that reflected their respective dimensions. Examining the relationships between these variables and fiscal policy sustainability, prior research has utilized comparable measures (Fuchs, Brown, & Rounsevell, 2020; Pashang & Weber, 2023).

The analysis utilized a total of 453 completed questionnaires, yielding a response rate of 96.8%. The questionnaires were administered via Google Forms, and the link to the questionnaire was sent to the participants' WhatsApp after they gave their informed consent to participate in the study. The collection of data occurred between 6th October 2023 and 26th January 2024. Using descriptive statistics, such as means and frequencies, the collected data were summarized to provide an overview of the variables and sample characteristics. To investigate the relationships between variables and test the research hypotheses, inferential statistics, specifically multiple regression analysis, were applied. Participant availability and internet connectivity were the most common issues encountered during data collection. Internet connectivity issues caused delays in responses for participants from remote MMDAs. It was also challenging for officials to participate because of their demanding schedules, particularly in metropolitan MMDAs. We responded to these concerns by employing more conventional methods of communication, such as phone calls, and assisted with internet access when requested.

This study's research methodology ensured the validity and precision of the findings. The study was able to collect data from a representative sample of Ghana's MMDAs by employing a quantitative methodology and descriptive survey design. Multiple departments within the MMDAs enabled a comprehensive comprehension of the factors influencing the relationship between green budgeting practices and fiscal policy sustainability. Throughout the research process, ethical considerations were adhered to, including obtaining informed consent from participants and protecting their anonymity and confidentiality. These ethical practices protected the rights and well-being of the involved parties.

The OLS (Ordinary Least Squares) model used in this study examines the moderating effect of Green Budget Tagging (GBT) on the nexus between green budgeting practices and fiscal policy sustainability in the Metropolitan Municipal and District Assemblies (MMDAs) of Ghana. The model is specified as follows:

$$FSP = a_0 + \beta_1(CCAM) + \beta_2(WMG) + \beta_3(RED) + \beta_4(STR) + \beta_5(NRC) + \beta_6(GBT) + \varepsilon \quad (1)$$

In this model, the dependent variable is FSP, which represents a measure of fiscal policy sustainability. The independent variables include Climate Change Adaptation and Mitigation (CCAM), Waste Management (WMG), Renewable Energy Development (RED), Sustainable Transport (STR), and Natural Resource Conservation (NRC), which represent different dimensions of green budgeting practices. The moderating variable is Green Budget Tagging (GBT), which captures the extent to which budget allocations are specifically tagged for environmental objectives. The coefficients β1 to β5 represent the effects of each independent variable (CCAM, WMG, RED, STR, NRC) on the dependent variable FSP, while β6 represents the moderating effect of GBT on the relationships between the independent variables and FSP. The error term ε accounts for unexplained variation in the model. By estimating the OLS model, the

study aims to assess the individual effects of each independent variable on fiscal policy sustainability (FSP) and to examine whether Green Budget Tagging (GBT) moderates these relationships.

We employed multiple regression analysis to assess the direct effects of these environmental variables on sustainable fiscal policies, as well as the moderating effects of green budget labelling. The technique is suitable for the study objectives because it allows us to examine the independent operations of various green budgeting practices and their interactions with one another. The research employed multiple regression to assess the impact of each independent variable on fiscal sustainability and the moderating influence of green budget labelling. The study's hypotheses, aimed at determining the direct and moderating effects on the sustainability of fiscal policy, rely heavily on this statistical method for testing.

RESULTS AND DISCUSSION

Demographic information of participants and the MMDAs

A demographic analysis of the study illuminated the characteristics of the individuals. Young adults (25–34 years old) made up more than 60% of the participants, with 20% in the 18–24 age group and 18% in the 35–44 age group following. This indicates a concentration within the adult demographic, specifically between the ages of 18 and 35. A notable gender discrepancy was observed, with males comprising 82.8% of the participants and females comprising 17.2%. Due to this distinction, additional research that is specific to gender may be required to ascertain the generalizability of the study. In terms of educational achievement, a master's degree was the most commonly held qualification, held by 69.1% of the participants. 9.5% of the population possessed professional (ICAG) credentials, while 21.4% possessed bachelor's degrees. This indicates that the majority of the participants hold master's degrees or higher, which signifies their advanced level of education.

Table 1 Demographic Information

		N	%
Age	18-24	95	21.0
	25-34	273	60.3
	35-44	85	18.7
Total		**453**	**100.0**
Gender	Male	375	82.8
	Female	78	17.2
Total		**453**	**100.0**
Educational Level	Bachelor's degree	97	21.4
	Master's degree	313	69.1
	Professional (ICAG)	43	9.5
Total		**453**	**100.0**
MMDAs Size	Small	118	75.6
	Medium	29	18.6
	Large	9	5.8
Total		**156**	**100.0**
Urban/Rural Composition	Urban	84	53.8
	Rural	12	7.7
	Balanced rural and urban	60	38.5

Total	**156**	**100.0**

The majority of participants (75.6%) came from small MMDAs (Districts), with 18.6% from medium-sized MMDAs (Municipals) and only 5.8% from large MMDAs (Metropolitan). This suggests a focus on regions with smaller or moderate populations.

Reliability analysis

We used measuring techniques with reliability values (Cronbach's alpha) to assess the internal consistency of constructs such as fiscal policy sustainability and green budget labelling. We determined that all constructions exceeded the widely acknowledged threshold of 0.7, with Cronbach's alpha values ranging from 0.827 to 0.946. This demonstrates that the survey questions were consistent across all constructs and accurately measured the intended ideas. The items belonging to each construct were substantially associated with one another, as evidenced by the high degree of internal consistency indicated by these values. For example, a Cronbach's alpha of 0.946 for the fiscal policy sustainability construct indicates that the responses of individuals to numerous queries that assessed the same aspect were consistent. This demonstrates the instruments' dependability and consistency across all respondents, as well as the robustness of the measuring techniques. The investigation's high dependability values make the results more persuasive. The survey instruments accurately assessed the constructs, rendering the results reliable indicators of the participants' perspectives on sustainable fiscal policy and green budgeting practices. Reliability is of the utmost importance in determining the overall validity of the research. Consistent measurement of the constructs increases the validity of the study's results, suggesting that the instruments examined the variables of interest. The survey instrument's reliability is demonstrated, which is critical for effective data analysis, and the study's findings are further supported by this evidence.

Table 2 Reliability Analysis

Constructs	Number of Items	Cronbach's Alpha
FSP	4	0.946
GBT	3	0.827
CCAM	3	0.908
WMG	3	0.879
RED	3	0.914
STR	3	0.953
NRC	3	0.928

FSP: Fiscal policy sustainability, GBT: Green budget tagging, CCAM: Climate change adaptation and mitigation, WMG: Waste management, RED: Renewable energy development, STR: Sustainable transport: Natural resource conservation

 ISSN 2715-8071 (online)

Descriptive analysis

The statistics provided include the number of observations (N), minimum value, maximum value, mean, standard deviation (SD), skewness, and kurtosis.

Table 3 Descriptive Statistics

	N	Min	Max	Mean	SD	Skewness		Kurtosis	
						Stat	Std. Err	Stat	Std. Err
FSP	453	1	7	5.36	1.28	-1.79	0.12	2.23	0.23
GBT	453	3	7	5.65	0.69	-0.84	0.12	1.16	0.23
CCAM	453	1	7	5.28	1.27	-1.33	0.12	1.70	0.23
WMG	453	1	7	5.27	1.47	-1.43	0.12	1.25	0.23
RED	453	1	7	5.30	1.18	-1.48	0.12	2.60	0.23
STR	453	1	7	5.49	1.25	-1.79	0.12	2.05	0.23
NRC	453	1	7	5.48	1.27	-2.01	0.12	2.34	0.23

FSP: Fiscal policy sustainability, GBT: Green budget tagging, CCAM: Climate change adaptation and mitigation, WMG: Waste management, RED: Renewable energy development, STR: Sustainable transport: Natural resource conservation

The descriptive data of the study illuminate the research objectives by disclosing the perspectives of respondents regarding green budgeting strategies. The primary goal of this study was to assess the influence of green budget tagging on the relationship between fiscal policy sustainability and green budgeting practices in Ghana's MMDAs. Descriptive data, including standard deviations and mean values, indicated that respondents were overwhelmingly favourable toward green budgeting strategies, including waste management, renewable energy development, and climate change adaptation. According to respondents, the mean values of climate change adaptation (5.28), refuse management (5.27), and renewable energy development (5.30) demonstrate the significance of these activities. In accordance with the data's positive skewness, which affirms a favourable evaluation of green budgeting techniques, respondents tended to assign higher scores. This indicates that people view green budgeting as a crucial instrument for fostering fiscal sustainability, aligning with the study's main goal.

The data is more reliable due to the consistent level of agreement among respondents for constructs such as renewable energy development (1.18) and green budget categories (0.69), which have relatively

low standard deviations in comparison. These positive sentiments are significant because they suggest that the respondents understand the long-term importance of green budgeting for sustainability advancement. The study aims to determine whether the integration of green budgeting strategies into fiscal policies contributes to sustainable development. This directly aligns with that objective. The positive reception of green initiatives, despite potential obstacles, demonstrates that these techniques are considered beneficial even within the framework of Ghanaian local administration.

Regression analysis

The dependability of the OLS regression model is further validated by the results of the regression analysis, which are presented in Table 4, in addition to test results and model fit evaluations. In the presentation of these findings, three tiers of analysis are utilized. We will begin by examining it in the absence of interaction effects. Subsequently, we will apply conditional and unconditional effects in conjunction with interaction effects and then net effects.

Fiscal policy sustainability and climate change adaptation and mitigation are positively correlated, as indicated by the significant coefficient of 0.66 (p0.01). A highly significant correlation of 0.794 (p<0.001) exists between fiscal policy sustainability and waste management, suggesting that improved waste management techniques contribute to the long-term viability of fiscal policy. Similarly, promoting the use of renewable energy sources enhances the sustainability of fiscal policies in the long run, as evidenced by the highly significant coefficient of 0.858 (p<0.001). The coefficient associated with sustainable transport is 0.103; however, it lacks statistical significance (p=0.122), indicating that its influence on the sustainability of fiscal policy within this model is not substantial. The correlation coefficient of 0.998, which is extremely significant at p<0.001, indicates that endeavours aimed at natural resource conservation positively influence the sustainability of fiscal policy.

As indicated by the coefficient of -0.094, which is significant at p0.05, the interaction between green budget tagging and climate change adaptation and mitigation has a negative impact on the sustainability of fiscal policy. Likewise, the significant negative interaction effects on the sustainability of fiscal policy are denoted by the coefficients -0.097 (p<0.01), -0.101 (p<0.05), and -0.145 (p<0.001), respectively, for the interactions with natural resource conservation (GBTNRC), renewable energy development (GBTRED), and waste management (GBTWMG).

To illustrate, the aggregate of climate change adaptation and mitigation efforts can be expressed as 0.134[(-0.094 × 5.65)] + (0.665). The mean value of green budget tagging is 5.65, which indicates that it functions as a moderating variable. The unconditional effects of climate change adaptation and mitigation are 0.667, and the conditional effect of the interaction between green budget tagging and these two variables is -0.094. The net effect of climate change adaptation and mitigation efforts is 0.134, which indicates that for each unit increase in this variable, fiscal policy sustainability increases by 0.134 units. The fiscal policy sustainability increases by 0.246 units for each unit improvement in waste management, as indicated by the net effect of waste management of 0.246. The net effect of renewable energy development is 0.287, which indicates that fiscal policy sustainability increases by 0.287 units for each unit increase in renewable energy development. Natural resource conservation increases the sustainability of fiscal policy by 0.179 units for every one-unit increase in conservation efforts, with a net effect of 0.179.

By illustrating the effectiveness of the model in evaluating fiscal sustainability, the research underscores the crucial significance of environmental factors in this domain of fiscal policy sustainability.

Table 4 Green Budgeting Practices, Green Budget Tagging And Fiscal Policy Sustainability

 ISSN 2715-8071 (online)

	Dependent Variable: Fiscal Policy Sustainability				
	1	**2**	**3**	**4**	**5**
Constant	-3.527**	-3.544***	-3.931**	-0.340	-5.059***
	(0.005)	(0.000)	(0.001)	(0.532)	(0.000)
CCAM	0.665**				
	(0.007)				
WMG		0.794***			
		(0.000)			
RED			0.858***		
			(0.000)		
STR				0.103	
				(0.122)	
NRC					0.998***
					(0.000)
GBT	1.453***	1.358***	1.381***	0.696***	1.681***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GBT×CCAM	-.094*				
	(0.039)				
GBT×WMG		-0.097**			
		(0,006)			
GBT×RED			-0.101*		
			(0.023)		
GBT×STR				0.039**	
				(0.005)	
GBT×NRC					-0.145***
					(0.000)
Net Effects	0.134	0.246	0.287	Na	0.179
Observation	453	453	453	453	453
R^2	0.389	0.456	0.444	0.431	0.431
Adjusted R^2	0.389	0.452	0.441	0.427	0.427
F-Statistics	97.09***	125.42***	119.61***	113.37***	113.30***

***,**,* P<0.001,P<0.05, P<0.01 respectively. GBT: Green budget tagging, CCAM: Climate change adaptation and mitigation, WMG: Waste management, RED: Renewable energy development, STR: Sustainable transport: Natural resource conservation. na: not applicable because at least an unconditional or a conditional effect needed for the computation of net effects is not significant.

Discussion

The results of this study shed light on the relationship between the moderating effect of green budget labelling, long-term fiscal policy viability, and environmentally conscious expenditure. The results offer novel perspectives on the intersection of environmental and fiscal policy, particularly in the context of a developing nation such as Ghana. Additionally, they both confirm and refute previous research. In this

section, we examine the extent to which these findings complement, diverge from, and augment existing knowledge. Additionally, we examine the broader implications for budgetary policy, particularly in relation to environmental sustainability in both developed and developing countries.

Prior research has demonstrated a positive correlation between fiscal policy sustainability and green budgeting practices such as the development of renewable energy, conservation of natural resources, adaptation and mitigation of climate change, and waste management. Long-standing research has established the positive economic consequences of integrating waste management, renewable energy, and climate change mitigation initiatives into budget planning. The maintenance of ecosystems and the enhancement of long-term budgetary sustainability are achieved by addressing environmental concerns such as waste management and renewable energy, which reduce the costs of future environmental deterioration (Alare et al., 2022). According to Mills (2020), the development of renewable energy is critical for reducing reliance on the volatile fossil fuel market and achieving more consistent and sustainable economic outcomes. The findings of this study corroborate those assertions, underscoring the importance of these environmentally friendly policies in promoting long-term economic prosperity.

However, the study's results also suggest more complex dynamics, particularly in the context of the moderating influence of green budget labelling, which demonstrated unexpectedly negative repercussions. Despite green budget tagging's reputation as a tool to enhance transparency and accountability in environmental expenditure (Petrie, 2021), this study challenges the notion that it consistently has a positive impact on fiscal policy outcomes via its negative moderating effects. One potential explanation for this discovery is that bureaucratic delays or inefficiencies in underdeveloped nations, such as Ghana, make it more difficult to implement green budget labelling schemes. Other research in more developed contexts, such as the study on climate financing (Pindiriri & Kwaramba, 2024), suggests that green budget labelling may be advantageous when institutional frameworks are well-established. Institutions inadequately equipped to manage tagged funds, like Ghana, may erode the potential benefits of green budget tagging. The findings suggest that customizing green budget labelling to the unique institutional capabilities of the country implementing it is necessary, despite its significant potential.

The notion that sustainable transportation programs will not significantly influence the long-term sustainability of budgetary policies is also at odds with prior research. Nieuwenhuijsen (2020) and Hurlimann et al. (2021) emphasize the environmental and economic benefits of sustainable transportation systems, with a particular emphasis on metropolitan regions, including the reduction of carbon emissions, the enhancement of air quality, and the promotion of long-term economic sustainability. In the Ghanaian context, sustainable transportation does not appear to have a substantial impact on budgetary sustainability. This may be because Ghana's transportation network is still in the early stages of development, necessitating substantial expenditures before the country can capitalize on the financial benefits of environmentally friendly modes of transport. A study by Eliasson (2021) and Greene & Wegener (1997) posits that the fiscal benefits of sustainable mobility often accrue over longer periods and may require substantial initial expenditures, which could account for the absence of a quick economic effect in Ghana. This conclusion is consistent with their arguments. These findings have implications that extend beyond Ghana; they demonstrate that emergent nations, in particular, necessitate more sophisticated approaches to integrating environmental objectives into budgetary policy. The challenges associated with green budget labelling underscore the need for institutional development, while the benefits of green budgeting practices on fiscal sustainability underscore the importance of incorporating environmental sustainability into fiscal planning.

 ISSN 2715-8071 (online)

Other developing nations with similar institutional structures, which may face challenges in adopting green budget labelling, can apply the lessons learned from Ghana. Policymakers should prioritize the efficient management and allocation of classified money in their efforts to enhance institutional capacity. To accomplish this objective, it may be necessary to optimize the labelling process, foster collaboration between the fiscal and environmental departments, and ensure transparency and accountability throughout the budgeting process. For instance, Brazil and India have demonstrated that the success of green budgeting initiatives is contingent upon the presence of robust institutional support (Sakrak et al., 2022). Nations with inadequate institutional capacities should exercise caution when considering green budget labelling, as evidenced by Ghana. These countries should ensure that they have adequate processes in place to prevent inefficiencies that could potentially diminish the benefits of green budgeting. In more developed countries, where institutional capacity is typically superior, green budget labelling may prove to be a more advantageous approach to integrating environmental objectives into fiscal frameworks. For example, green budget tagging has been instrumental in the allocation of fiscal resources to sustainability objectives as part of the broader Green Deal agenda in the widely adopted European Union (Fuchs et al., 2020). However, the Ghanaian example demonstrates that labelling mechanisms require close supervision to ensure that they contribute to fiscal sustainability rather than detract from it, even in long-standing institutions.

Legislators in Ghana and other emerging nations should meticulously evaluate the study's results. In Ghana, the use of green budget labelling and green budgeting has demonstrated that each country has its own unique institutional, economic, and environmental circumstances. Consequently, it is necessary to adjust our methodologies accordingly. The study underscores the importance of prioritizing environmental sustainability as a top priority in budget planning in developing regions, such as sub-Saharan Africa, with a particular emphasis on renewable energy and waste management. These strategies, which have demonstrated budgetary and environmental benefits, should be the focus of efforts to promote long-term sustainability. The results suggest that green budget marking can boost policy effectiveness and speed up resource allocation, but if the necessary institutional frameworks are not in place beforehand, it could lead to unexpected consequences. Consequently, policymakers in these regions must work to fortify their institutions to ensure the efficient implementation of green budget labelling. To ensure the effective and intended use of the funds, it may be beneficial to invest in training for government personnel, enhance cooperation between departments, and establish explicit monitoring and evaluation systems.

The findings shed light on the challenges associated with implementing green budgeting strategies in more industrialized countries. The study's findings indicate that green budget labelling is effective in countries with robust fiscal institutions. However, the study also advises caution when developing and executing tagging strategies in these instances. Although green budgeting has the potential to advance sustainable development, the EU's experience has demonstrated that robust governance structures, flexibility, and transparency are essential to prevent the pitfalls observed in less developed regions (Bilal, 2019). In a broader context, this implies that green budget labelling, while beneficial, is not a panacea and must be adjusted to accommodate the distinctive financial and institutional circumstances of each country. The study's findings regarding sustainable transportation have substantial implications for city development and fiscal policy beyond Ghana. Despite the critical significance of sustainable transport systems in reducing emissions and promoting environmental sustainability, governments in developing regions may need to adopt a long-term perspective when investing in them. This investigation did not identify any immediate fiscal advantages. Our findings align with Cervero (2021) perspective, which suggests that sustainable transportation investments typically yield monetary and fiscal benefits only after

significant initial expenditures and extended timeframes. It is the responsibility of legislators to account for these delayed benefits when incorporating sustainable transportation initiatives into broader, more long-term economic strategies.

CONCLUSION

This study sheds light on the role of green budget labelling in Ghana's MMDAs in reducing the correlation between environmental concerns and fiscal policy sustainability. The research identifies waste management, renewable energy development, conservation of natural resources, and adaptation to climate change as examples of green budget practices that contribute to fiscal sustainability. Nevertheless, the implementation of green budget labelling introduces an unexpected level of complexity. The notion that green budgeting may occasionally exert a moderating influence on these correlations is a critical finding that challenges conventional assumptions. This discovery highlights the importance of designing green budget plans that consider institutional capacity, especially in developing countries.

However, it is important to acknowledge that this investigation does possess deficiencies. Initially, the findings were limited to Ghana, as the investigation exclusively examined Ghanaian local governments. Secondly, it is challenging to infer causal relationships from cross-sectional data regarding the correlation between green budgeting and long-term financial sustainability. Furthermore, the study likely overlooked other relevant variables that could have impacted the sustainability of fiscal policy, as it only examined a subset of environmental conditions.

Future research should be able to surmount these constraints by conducting longitudinal studies that investigate causal correlations across time. Comparative research conducted in other countries or regions would render the results more relevant to a broader audience. By examining the interactions between green budget tags and other environmental variables, such as biodiversity protection and pollution management, we can gain a more comprehensive understanding of the broader implications of green budget tags on fiscal sustainability. In summary, this study significantly contributes to the growing body of literature on green budgeting by offering critical perspectives on the potential benefits and drawbacks of environmental measures in developing countries such as Ghana.

REFERENCES

Alare, R. S., Lawson, E. T., Mensah, A., Yevide, A., & Adiku, P. (2022). Assessing nuanced social networks and its implication for climate change adaptation in northwestern Ghana. *World Development Perspectives*, *25*, 100390. https://doi.org/10.1016/j.wdp.2021.100390

Bilal, S. (2019). *Leveraging the next EU budget for sustainable development finance*. Maastricht, The Netherlands: ECDPM.

Buchanan, J. M., & Tullock, G. (2003). What is public choice theory. In *Rationalizing capitalist democracy: The cold war origins of rational choice liberalism* (p. 133).

Cervero, R. (2021). Efficient urbanisation: Economic performance and the shape of the metropolis. *Urban Studies*, *38*(10), 1651–1671. https://doi.org/10.1080/00420980120084804

Eliasson, J. (2021). Efficient transport pricing–why, what, and when? *Communications in Transportation Research*, *1*, 100006. https://doi.org/10.1016/j.commtr.2021.100006

Fobih, N. (2020). NPM reforms in Ghana's public sector management \& administration: Changing trends in MDAs \& MMDAs functions. *Journal of Public Administration and Governance*, *10*(4), 125141.

Fricker, R. D. (2008). Sampling methods for web and e-mail surveys. In *The SAGE handbook of online research methods*. SAGE Publications Ltd.

Fuchs, R., Brown, C., & Rounsevell, M. (2020). Europe's Green Deal offshores environmental damage to other nations. *Nature*, *586*(7831), 671–673.

Ghana Statistical Service. (2021). *Population housing census: Provisional results Ghana*.

Goodrick, E., & Salancik, G. R. (1996). Organizational discretion in responding to institutional practices: Hospitals and cesarean births. *Administrative Science Quarterly*, *41*(1), 1–28.

Greene, D. L., & Wegener, M. (1997). Sustainable transport. *Journal of Transport Geography*, *5*(3), 177–190. https://doi.org/10.1016/S0966-6923(97)00013-6

Hair, J. F., Risher, J. J., & Ringle, C. M. (2019). *When to use and how to report the results of PLS-SEM*. *31*(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Hurlimann, A., Moosavi, S., & Browne, G. R. (2021). Urban planning policy must do more to integrate climate change adaptation and mitigation actions. *Land Use Policy*, *101*, 105188. https://doi.org/10.1016/j.landusepol.2020.105188

Lu, W., Long, W., & Yuan, L. (2023). A machine learning regression approach for pre-renovation construction waste auditing. *Journal of Cleaner Production*, *397*, 136596. https://doi.org/10.1016/j.jclepro.2023.136596

Meyer, J. W., & Rowan, B. (1977). Institutionalized Organizations: Formal Structure as Myth and Ceremony. *American Journal of Sociology*, *83*(2), 340–363. https://doi.org/10.1086/226550

Mills, M. P. (2020). *Mines, minerals, and "green" energy: A reality check*.

Narayana, M. R. (2016). India's proposed universal health coverage policy: Evidence for age structure transition effect and fiscal sustainability. *Applied Health Economics and Health Policy*, *14*(6), 673–690. https://doi.org/10.1007/s40258-016-0270-1

Nieuwenhuijsen, M. J. (2020). Urban and transport planning pathways to carbon neutral, liveable and healthy cities; A review of the current evidence. *Environment International*, *140*, 105661. https://doi.org/10.1016/j.envint.2020.105661

North, D. C. (1990). A transaction cost theory of politics. *Journal of Theoretical Politics*, *2*(4), 355–367.

Offei, F., Koranteng, L. D., & Kemausuor, F. (2021). Integrated bioethanol and briquette recovery from rice husk: a biorefinery analysis. *Biomass Conversion and Biorefinery*, *13*(9), 7645–7661. https://doi.org/10.1007/s13399-021-01731-3

Pashang, S., & Weber, O. (2023). AI for sustainable finance: Governance mechanisms for institutional and societal approaches. In *The ethics of artificial intelligence for the sustainable development goals* (pp. 203–229). Springer.

Pendergrass, K. L., Sampson, W., Walsh, T., & Alagna, L. (2019). Toward environmentally sustainable digital preservation. *The American Archivist*, *82*(1), 165–206. https://doi.org/10.17723/0360-9081-82.1.165

Petrie, M. (2021). Environmental governance and the greening of fiscal policy. In *Environmental governance and greening fiscal policy: Government accountability for environmental stewardship* (pp. 109–142). Springer. https://doi.org/10.1007/978-3-030-83796-9_5

Pfeffer, J. (1987). A resource dependence perspective on intercorporate relations. *Intercorporate Relations: The Structural Analysis of Business*, *1*(1), 25–55.

Pindiriri, C., & Kwaramba, M. (2024). Climate finance in developing countries: Green budget tagging and resource mobilization. *Climate Policy*, 1–15. https://doi.org/10.1080/14693062.2024.2302325

Sakrak, O. A., Battersby, B., Gonguet, M. F., Wendling, C., Wendling, M. C. P., Charaoui, J., & Petrie, M. (2022). *How to make the management of public finances climate-sensitive–"Green PFM"*.

Sari, M. M., Inoue, T., Harryes, R. K., Suryawan, I. W. K., Yokota, K., Notodarmojo, S., & Priyambada, I. B. (2022). Potential of Recycle Marine Debris in Pluit Emplacement, Jakarta to Achieve Sustainable Reduction of Marine Waste Generation. *International Journal of Sustainable Development and Planning*, *17*(1), 119–125. https://doi.org/10.18280/ijsdp.170111

Seah, S., & Addo-Fordwuor, D. (2021). Roles and strategies of the local government in municipal solid waste management in Ghana: Implications for environmental sustainability. *World Environment*, *11*(1), 26–39.

Vojnovic, I. (2014). Urban sustainability: Research, politics, policy and practice. *Cities*, *41*, S30–S44. https://doi.org/10.1016/j.cities.2014.06.002

 ISSN 2715-8071 (online)