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ACHIEVING SUSTAINABLE DEVELOPMENT GOAL 15 IN SUB-SAHARAN AFRICAN COUNTRIES: ROLE OF TAX REVENUE AND GOVERNANCE QUALITY

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Abstract

Environmental Sustainability is a global call to act in the interest of protecting and preserving the environmental resources today for a better future. This could be achieved through effective tax policies and good governance. However, many countries in Sub-Saharan Africa are faced with environmental sustainability problems such as unregulated and lack of management use of natural resources of Life on Land (LIOL) as indicated in the Sustainable Development Goals. The study examined the effect of tax revenue and governance quality on Life on Land in Sub-Saharan African countries. Ex-post facto research design was adopted. The population of the study was 48 Sub-Saharan African countries. A sample size of 36 countries was purposively selected based on the availability of data. The data were sourced from the World Development Database covering 21 years (2001-2021). Validity and reliability were premised on the verified data on the website of World Bank Database. Findings revealed that tax revenue significantly affected LIOL ($Adj.R^2 = 0.08$, $F(5, 792) = 36961.09$, $p < 0.05$). Also, the study further revealed that governance quality significantly mediated the effect of tax revenue on the LIOL ($Adj.R^2 = 0.16$, $F(11, 786) = 395180.42$, $p < 0.05$). The study concluded that tax revenue improved environmental sustainability in Sub-Saharan African countries.

Keywords: Environmental Sustainability, Government, SDGs, Sub-Saharan African Countries, Tax Revenue

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Introduction

Tax revenue is a fundamental component of government financing, tax revenue is essential to government funding that is used in the provisions of key public services such as infrastructure development, health services, educational institutions and research activities, as well as other social programs. Tax policies and revenue allocation mechanisms over the past two decades had witness a growing recognition of the importance of tax revenue contributing to environmental sustainability in Sub-Saharan African countries have increased, with the aim of prioritizing environmental conservation alongside economic growth. Sub-Saharan African (SSA) countries, environmental sustainability had remained a pressing issue amidst economic and developmental challenges, (Olubiyi, 2024), the role of tax revenue in supporting environmental initiatives has garnered increasing attention over the years. SSA countries have faced significant environmental challenges, including deforestation, land degradation, biodiversity loss, and loss of endangered species (UN Environment Programme, 2019). These challenges are exacerbated by rapid population growth, urbanization, and limited financial resources for environmental conservation efforts. The increased in desertification in the recent time had led to food insecurity, and loss of livelihoods. Sub-Saharan African countries climate variability, population growth, and poor water management practices had resulted to forced migration, food insecurity, water scarcity. Which negatively affected agricultural productivity; spiking food prices leading to food scarcity, lack of access to clean water, and human health challenges (World Health Organization, 2016).

Soil contamination that could have arisen from oil spillage and gas flaring alter soil physical properties, causing water infiltration and soil porosity reduction. The production of goods and services then occur in form of weak unsustainable practices that are premised on a continuous exploitation of natural resources with little or no means of controlling the resultant waste from such activities. In addition, the high-level consumption of raw materials, energy use and waste materials, with the environment at the receiving end; that could be in form of loss of marine coastal ecosystems (Kumar et al., 2020). Adekunle (2021) examine tax incentives for sustainable agricultural practices leading to the reduction in land degradation rates in most developing countries. Tax breaks as well subsidies for eco-friendly farming methods that helps incentivized farmers to adopt practices that align with sustainable land use objectives for sustainability purposes. Gupta et al. (2022) opined that, current tax systems in SSA would not be able to generate domestic revenues to the extent needed for financing the Sustainable Development Goals (SDGs). SDG 15 general overview is to protect, restore and promote the conservation and sustainable use of terrestrial ecosystems. Which involve drive towards sustainably managing the forests, halting deforestation, combating desertification, restoring degraded land and soil, ending biodiversity los s and protecting the threatened species globally. Achieving the commitments to the 2030 Agenda, Asia and the Pacific has increased its protection of terrestrial and freshwater ecosystems in order improve forest management as well as the conservation of mountain ecosystems. The Wildlife and ecosystem conservation is vital to prevent future pandemics and the transfer of diseases from animals to humans.

According to Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, 2018) Asia-Pacific Regional Assessment discovered that, the unsustainable use, illegal trade in wildlife, conversion of habitats, the invasive alien species, pollution and climate change, have a combine effect on socioeconomic and demographic changes leading to ecosystems risk, which threatened livelihoods and food security for millions of people vulnerable in the communities. Findings show that, nature is often damaged because of unsustainable economic development. In addition, overexploitation of natural resources, the overuse and misused of chemical fertilizers and pesticides. The unsustainable traditional practices in agriculture and horticulture that had for years negatively impact sustainable

livelihoods, increasing poverty and food insecurity, and reduce incomes among vulnerable groups. The value of the illegal wildlife trade is estimated at $US7 billion to $US10 billion globally (Asia-Pacific SDG Gateway). Another problem identified is the unsustainable large demand for forest either for household use, industrial reason or other exploitation and pressures to develop land for agriculture purposes, had increase the climate change, in Sub-Saharan African countries, lack of funding that could help in forest technology monitoring system, the lack of collaboration among the locals due to corruption affecting biodiversity sustainability and preservation (Louman et al., 2020; Osman-Elasha et al., 2009).

The objective is to determine how governance quality mediates the effect of tax revenue on the attainment of Life on land (SDG15) in Sub-Saharan African countries. Research hypotheses show that governance does not significantly mediate the effect of tax revenue on the attainment of SDG15 in Sub-Saharan African countries. The study adopted export, goods and services, profit, income and capital gain tax, customs duties, international trade, and other taxes as measures of tax revenue factors. The rule of law, control of corruption, government effectiveness, regulatory quality, voice accountability, political stability, corruption control quality as measures of governance. The purpose of this paper is to draw out the study gap as against some previous studies, necessitating examining tax revenue system and governance quality capable of influencing sustainability either socially, economically or environmental sustainability. When there is ineffective tax revenue administrative mechanism put in place with weak governance system, every layer of such country will be affected negatively; either in firm or at governmental level, where natural resources in the ecosystems are over exploited causing harms to the environmental sustainability of both the human and other biodiversity in the environment. A strong institution with rule of law, effective governance and political efficiency is sure part to environmental sustainability; regulations that are enough to deter firms, individual from depleting the natural resources.

Literature Review

Conceptual Review

Government policy on deforestation had been one that have increased government spending on social safety nets led to greater agricultural expansion at the expense of forests, Akinyele et al. (2022) indicated that government policies and government spending had unintentionally increase deforestation as evident in Cameroon, where partial bans and taxation led to more deforestation, and in developing nations. Adeniyi et al. (2021) and Ojo et al. (2023) show mixed effects of tax revenue on environmental outcomes. In Eritrea, tax revenue reduced deforestation, while in Guinea-Bissau and Equatorial Guinea, it did not. In Ghana, tax revenue positively impacted biodiversity due to targeted tax policies, unlike in Nigeria. Short-term vs Long-term Effects: The studies suggest that policy impacts can vary over time. While short-term effects might include increased deforestation and emissions Adeyemi (2023) long-term effects may not be as significant, indicating the need for sustained and well-targeted policy measures Johnson & Omodero (2021) and Brown et al. (1987) collectively examine the relationship between governance control, tax revenue, and deforestation across various African contexts, with a focus on Ghana, Nigeria, and five sub-Saharan countries. And their findings showed that, there is a positive relationship between governance control, tax revenue, and deforestation, suggesting that effective governance control is associated with higher tax revenue from deforestation activities in Ghana. In addition, the results showed that stronger governance control was linked to an increased tax revenue and lower deforestation rates. This implies that effective governance can promote sustainable forest management while enhancing revenue generation. Governance strategies that balance economic and environmental objectives to achieve sustainable outcomes in the region. However, in Ghana, governance control is linked to higher tax revenue from deforestation activities, indicating a

potential trade-off between revenue generation and environmental sustainability (Johnson & Omodero, 2021). Barbier & Burgess (2021) opined that, regional governance practices could have similar effects on the variables, highlighting the importance of governance quality in managing both economic and environmental outcomes the significant effect between governance control, tax revenue, and deforestation observed across the five sub-Saharan countries suggests Riggio et al. (2020) observed that about 75% of the land surface area are directly affected by human economic activities. The past 12,000 years have experience an anthropogenic land use increased tremendously and that on a global scale (Ellis et al., 2020). The continuous use of land resources has risen to a level that endangers the survival of many species on planet earth and human welfare (Beckmann, 2021). Sustainable Development Goals (SDGs) Agenda 2030 are journey of humankind towards recognizing common responsibility for the sustainability of planet Earth as a strategy principle for economic and political development (Shi et al., 2019). The agenda policy is to improve for better integrating biodiversity into planning and enhancing financial resources for conservation and sustainable use of life on land. Mane et al. (2022) this study examined the impact of governance control of tax revenue on forest resources conservation in Senegal from 2000 to 2020 using an Auto-Regressive Distributed Lag (ARDL) mechanism. The researchers used an ex-post facto research design to collect time series data. Tax revenue was measured by various tax collections, while governance control was represented by a dummy variable indicating whether tax policies favored ecosystem conservation. The study also considered control variables such as population growth, household income, energy consumption, inflation, energy prices, and household expenditures. The results showed that governance control of tax revenue significantly improved forest resources conservation, attributed to a specific tax net dedicated to maintaining and protecting forest reserves.

Theoretical Review

Ecological modernization theory (EMT) emerged in the early 1980s, primarily articulated by Joseph Huber and further developed by Martin Jänicke and Arthur P. J. Mol. This theory posits that economic and technological advancements can align with environmental sustainability, suggesting that modern industrial societies can transition to more ecologically sustainable practices through innovations, regulatory frameworks, and institutional reforms (Jänicke, 2008). The core idea is that environmental protection does not necessarily conflict with economic growth; instead, ecological rationality can be integrated into the production and consumption processes, leading to the "greening" of industry and society (Mol & Spaargaren, 2000). EMT further emphasizes the role of state policies, market dynamics, and technological innovations in driving environmental reforms. Jänicke (2008) highlights those proactive environmental policies can stimulate economic benefits and technological advancements, resulting in a win-win situation for both the environment and the economy. Additionally, Mol argues that the active involvement of various social actors, including businesses, non-governmental organizations, and the public, is crucial for achieving ecological modernization. This collaborative approach fosters the development and diffusion of environmentally friendly technologies and practices, thereby promoting sustainable development within modern industrial societies (Mol & Spaargaren, 2000; Jänicke, 2008). As such, EMT provides a hopeful perspective on addressing environmental challenges through modernization and innovation.

Empirical Review

Surmanian et al. (2023) this study assessed the impact of governance control of tax revenue on land fertility preservation in Lesotho from 2000 to 2022 using a Panel Generalized Method of Moments (GMM) approach. The research utilized quarterly data and a correlational design to gather secondary data. Governance control of tax revenue was measured using a dummy variable indicating whether tax policies favored land fertility

preservation, while tax revenue was measured by tax receipts. The results indicated that governance control of tax revenue had a significant positive impact on preserving land fertility and resources. The study concluded that land usage taxes enhanced governance control of tax revenue, thereby boosting land fertility and resource preservation in Lesotho. Similarly, Mane et al. (2022) and Surmanian et al. (2023) stated that, governance control of tax revenue significantly contributed to land fertility preservation in Lesotho, underscore the importance of allocating tax revenue to specific environmental conservation efforts. In Senegal, a dedicated tax net for forest reserves played a crucial role in conservation efforts. In Lesotho, land usage taxes were key to enhancing land fertility and resource preservation. Also, both studies employed robust econometric methods (ARDL for Senegal and Panel GMM for Lesotho) to analyze the impact of governance control on environmental outcomes, ensuring the reliability and validity of their findings. Inclusion of various control variables, such as population growth, household income, energy consumption, inflation, and household expenditures, in the studies provided a comprehensive analysis of the factors influencing environmental conservation. These findings highlighted the critical role of targeted tax policies and governance quality in achieving sustainable environmental outcomes, reinforcing the need for tailored strategies that prioritize specific conservation goals. Gupta et al. (2022) investigated the effect of tax buoyancy in Sub-Saharan Africa and its Determinants using 44 sub-Saharan African (SSA) countries from1980-2017 using time series and panel techniques. The result findings show that, long-term tax buoyancy is high in most of SSA countries. Economically fragile states have lower short-term tax buoyancy reflecting their institutional weaknesses. Short-term buoyancy of personal income tax is significantly less than one. More so, the study discovered that short- and long-run tax responses are lower than those reported in previous cross-country studies, showing a reduction in the stabilization in the short run and fiscal sustainability in the long run. The study also discovered that government at the center shows debt and shadow economy exerts a downward pressure on tax buoyancy. Effective governance quality is critical in mobilizing tax revenue for environmental sustainability. Adeyemi (2023) highlights that governance quality issues, such as corruption and inefficient tax administration, significantly hinder tax revenue generation. Improving governance quality through transparency and accountability is essential for enhancing tax compliance and revenue Shafiq et al. (2022). The results revealed that the coefficients of grants received, various forms of taxes, and other revenue have a positive effect on economic growth but a negative effect on poverty and unemployment for African and developed countries. This finding suggests that improvements in tax revenue generation, grants and other revenue accumulation across different sources boost economic performance and the welfare of individuals in the analyzed countries. The findings show that getting more grants from different sources will help in achieving sustainable development, an improve financial stability, contributes to the economic growth and development in these countries

Methodology

To accomplish the study's goal, the survey research method was used. This was justified by the approach's value in gauging the ideas, opinions, and sentiments of various groups of people and enabling them to provide more accurate and truthful input on the research topic Olubiyi (2024), Olubiyi et al. (2023), Olubiyi (2022a), Olubiyi (2022b), Ukabi et al. (2023), and Uwem et al. (2021) with cross-sectional studies, have adopted this method in their respective research and found it useful. This paper is based on their earlier study methodology. Research Hypothesis $H_0$1: Tax revenue does not have significant effect on the attainment of life on land (SDG15) in Sub-Saharan African countries and Governance quality does not significantly mediate the effect of tax revenue on the attainment of SDG15 in Sub-Saharan African countries.

$LIOL_{it} = \beta_0 + \beta_1 CIDT_{it} + \beta_2 TIIT_{it} + \beta_3 TGS_{it} + \beta_4 TIPCG_{it} + \beta_5 TEPOT_{it} + \mu_{it}$
$LIOL_{it} = \beta_0 + \beta_1 CIDT_{it} + \beta_2 TIIT_{it} + \beta_3 TGS_{it} + \beta_4 TIPCG_{it} + \beta_5 TEPOT_{it} + \beta_6 VACP_{it} + \beta_7 POSP_{it} + \beta_8 GOEP_{it} + \beta_9 REQP_{it} + \beta_{10} ROLP_{it} + \beta_{11} COQP_{it} + \mu_{it}$

Research Findings

Table 1 Effect of Tax Revenue and Governance quality on the attainment of SDG 15 in SSA countries

WITHOUT CONTROL VARIABLE					**WITH CONTROL VARIABLE**				**Difference**	
Model 4A					Model 4B				Coeff	Prob
Variable	Coeff	Std. Err	T-Stat	Prob	Coeff	Std. Err	T-Stat	Prob		
Constant	53.776	2.303	23.35	0.000	58.43	2.487	23.49	0.000		
CIDT	0.525	0.065	8.01	0.000	0.567	0.081	6.95	0.000	+/+. Inc	Sig/Sig
TIIT	-0.333	0.036	-9.17	0.000	-.4439	0.057	-7.78	0.479	-/-. Inc	Sig/Insig
TGS	0.0204	0.014	1.37	0.169	0.0552	0.018	3.05	0.002	+/+. Inc	Insig/Sig
TICP	0.127	0.025	4.89	0.000	0.115	0.029	3.85	0.000	+/+. Dec	Sig/Sig
TEPOT	0 .386	0.057	6.70	0.000	0.261	0.085	3.08	0.002	+/+. Dec	Sig/Sig
VACP					0.046	0.026	1.80	0.072		
POSP					0.123	.036	3.40	0.001		
GOEP					0.078	0.023	3.36	0.001		
REQP					-0.1403	.0409	-3.43	0.001		
ROLP					-0.288	0.0+44	-6.54	0.000		
COQP					0.08	0.055	1.44	0.150		
Adj R^2	0.08				0.159				0.079	
F-Stat/Wald Stat (Prob)	36961.09 (0.000)				395180.42 (0.0000)					
Hausman Test	$chi^2_{(2)}$ = 1.91 (0.8609)				= 2.34 (0.9969)					
Testparm Test/LM Test	$chi^2_{(1)}$ = 5033.33 (0.0000)				$chi^2_{(1)}$ = 4487.60 (0.0000)					
Heteroskedasticity Test	$chi^2_{(13)}$ = 0.17 (0.6836)				$chi^2_{(1)}$ = 18.71 (0.000)					
Autocorrelation Test	$F_{(1, 33)}$ = 747.286 (0.0000)				$F_{(1, 33)}$ = 705.199 (0.0000)					
Cross sectional independence test	11.066 (0.0000)				6.956 (0.000)					

Source: World Bank Database, Worldwide Governance and SDGs percentage estimation Atlas Note: Test of Hypotheses 1 (without and with mediating variable)

The result of this study showed that tax variables do have a significant effect on SDG15, and TGS in particularly have a strong significant impact on achieving SDG15, much attention should be given to TGS as tax policy maker to enhance better collections, viz-a-viz other taxes though significant but very with small impact. The study in Table 1 showed that governance quality showed significant effect on the attainment of SDG15 that is, living things on land in sub-Saharan African countries. With over 100% compliance to rules guiding business activities relating to life in the ocean. From the result presented, strong significance existed that was very significant, indicating a higher level of compliance with VACP and GOQP, though another variable was significant but low. The result showed that, though users fear government and control, level of compliance in safeguarding the sea and contents there in, are low as indicated from the result analysis. The result showed significant value of grants

received; and various forms of taxes, and other revenue have a positive effect on economic growth but a negative effect on poverty and unemployment for African and developed countries. From the study and data presented above, with good governance control on tax revenue collections as well as structural policies environmental goals of living thing survival is possible in sub-Saharan African countries. Government will perform better on SDGs selected for this study if identified problem is solved. If area of weakness as discovered in this study is tackled and area with strength is boosted. At 5% level of significance of 0.05, and the degree of freedom was 11,786, F-statistics was 3951800.42, while probability of F-statistics was 0.000. This is less than adopted level of significance, therefore, the study rejected the Null hypotheses and Accepted the Alternate hypotheses, which implied that governance quality, tax revenue significantly affects the attainment of life on land (SDG15) in Sub-Saharan African countries. In general, F-statistics with a probability value of 0.000 implied that CIDT, TIIT, TGS, TIPCG and TEPOT jointly had a significant effect on the attainment of life on land (SDG15), and governance quality variables (VACP, POSP, GOEP, REQP, ROLP, GOQP) jointly have significant effect on water production (SDG15).

Conclusion

The result of findings showed that tax revenue significantly affected the attainment of life on land in Sub-Saharan African countries and governance control, tax revenue equally affects the attainment of life on land in SSA countries. The study recommended that governments of the region should be deliberate in funding environmental related matter by including environmental budget estimate into the annual budget, in re-addressing environmental challenges in the region. It also recommended that, government at every level include in educational syllabus, environmental related topics that would serve as a means of awareness on the need to be eco-friendly. Sub-Saharan African countries were advised to work on tax revenue and governance quality factors that are not faring well as discovered from the study. The study further recommended that, industries and household should key into practices that aids environmentally sustainability and being responsible to the protection of biodiversity by means of environmental regular awareness. More so, where revenue linkages are discovered, modern technology should be deployed that, in turn will increase revenue total from which certain amount would be set aside to tackle environmental menace in Sub-Saharan African countries

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