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Article

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The Nexus between Economic Growth, Energy Consumption, and Environmental Degradation in Kenya

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ABSTRACT

Energy is a crucial component of productivity and is regarded as an engine for economic growth. In countries where more energy is consumed, the standard of living is frequently higher. Yet utilizing energy also leads to the emission of harmful greenhouse gases like carbon dioxide emissions (CO_2) and sulphur dioxide emissions (SO_2). In this regard, this study examines the relationship between economic growth, energy consumption, and environmental degradation in Kenya using the Autoregressive Distributed Lag model (ARDL) from 1990 to 2019. The empirical results find that energy consumption and economic growth increase CO_2 emissions both in the short- and long-run in Kenya except for economic growth which is inconsequential in the short run. However, the study suggests the implementation of environmental regulations that would contribute in lowering pollution emissions. In addition, implementing policies that encourage investing in cleaner energy sources will reduce environmental pollution. The Kenyan policymakers should undertake various technological, behavioural, and other changes to increase its economy's overall energy efficiency.

Keywords: Economic Growth, Energy Consumption, Environmental Degradation
JEL Classifications: C32, O44, O55, Q43

1. INTRODUCTION

The vision of consistent economic growth and better environmental quality is increasingly becoming a hot topic, and international organizations, governments, and other stakeholders give it a lot of attention. There is a growing concern that increased energy demand, particularly from carbon-related sources, is linked to rising carbon emissions, which are damaging to both environment and human health. Environmental pollution and economic growth are related to each other, since increasing environmental pollution results in increased economic productivity. Moreover, Energy is a crucial component of productivity and is regarded as an engine for growing economy (Warsame, 2022). The standard of living is often greater in countries with higher energy usage. Nevertheless, energy use also causes the emission of greenhouse gases like CO_2 and SO_2, which harm the environment. Hence, throughout the past three decades, the most contentious and serious topic among environmental economists and policymakers has been energy consumption and economic growth nexus and how these two factors affect CO_2 emissions. Energy use is a primary driver of CO_2 emissions as evidenced by ample previous studies (Rahman, 2020; Warsame and Sarkodie, 2022; Kamran et al., 2019; and Jacques and Keho, 2016).

African countries have developed a few cooperating programs to deal with the scourge of climate change caused by environmental pollution, including the East Africa Community Climate Change Policy, the Framework of Southern and Northern Africa Climate Change Plans, and the Africa Ministerial Conference on Environment. The continent is highly susceptible to climate change due to its poor adaptation capacity, extreme poverty, and heavy reliance on rain-fed agriculture (Warsame et al., 2022; Warsame et al., 2021).

In the context of Kenya, it is the fourth largest economy in sub-Saharan Africa, with a projected nominal GDP of 110.35 billion USD in 2022. In addition to the country's estimated 53.01 million residents, the population is increasing due to a relatively high birth rate and a lower mortality rate (World Bank, 2021). Traditional biomass accounts for 68% of the country's energy consumption-particularly for the poor in urban areas, informal settlements, and rural areas), petroleum accounts for 22%, and other sources account for 10% (Sarkodie et al., 2020).

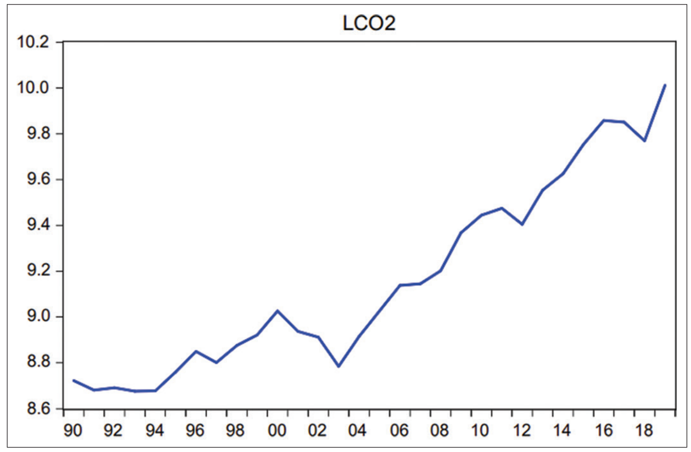
The Kenyan government has set ambitious aspirations for the country's future economic growth through its Vision 2030 program, planning on making it to middle-income status by that year. According to the National Climate Change Action Plan (NCCAP), a key component of the program is the creation of a stable and climate-resilient energy system (Longa and Zwaan, 2017). Kenya produced total greenhouse gas emissions (GHG) of 60.2 million Mt CO_2e (metric tons of carbon dioxide equivalent) in 2013 generating 0.13% of the world's greenhouse gas emissions. Notably, 62.8% of all emissions were produced by the agricultural sector, which was followed by energy consumption (31.2%), industrial processes (4.6%), and the waste sector (1.4%) (USAID, 2017).

Although Kenya's share of global greenhouse gas (GHG) emissions is low, the country's population is rising quickly and its economy is developing, which might cause its GHG levels to rise significantly in the future and exacerbate climate change. Additionally, considering Kenya's economy and energy supply both rely heavily on hydropower, agriculture, and tourism, they may be sensitive to the detrimental effects of an increase in the global average atmospheric temperature. As a result, the Kenyan government has established grand plans for both climate change adaptation and mitigation. Kenya pledged to reduce its greenhouse gas emissions by 30% from the estimated level by 2030 in its Nationally Determined Contribution (NDC) (Longa and Zwaan, 2017).

The decline of environmental quality in Kenya is proved by the increasing rate of CO_2 emissions, which is one of the main contributors to environmental pollution. The trend of carbon emissions (CO_2) emission rate has been escalating from 1990 to 2019 except in 2003 as shown in Figure 1. Because of the adoption of policies and initiatives, expanding the usage of energy consumption, converting coal to use gas, progressing in energy utilization, and constitutional adjustment in the country may be to account for the large decline in CO_2 levels in 2003.

The aim of this research is to examine the nexus between Kenya's energy consumption, economic growth, and CO_2. Energy consumption and economic growth are considered the main contributors to CO_2 emissions. There are ample studies that examined the nexus between these variables in developed countries (Xiangyu et al., 2021; Wang et al., 2017; Rahman, 2020). Nevertheless, the empirical evidence on this theme in developing countries such as Kenya is scanty. This research contributes to bridging that gap by examining the influence of energy consumption and economic growth on environmental pollution in Kenya using the Autoregressive Distributive Lag (ARDL) bound test (ARDL). The ARDL bound test has numerous benefits in contrast with other cointegration approaches. Engle and Granger and Johansen and Juselius's cointegration procedures require an identical order of integration, the ARDL method can be utilized if the variables are stationary at the level, first difference, or both. Both dependent and independent variables can employ various lags (Pesaran et al., 2001). The fresh insight provided by this study is how to create essential policy tools for considering economic growth as well as environmental sustainability that will be helpful to policymakers.

Figure 1: CO_2 emission in Kenya



2. LITERATURE REVIEW

The nexus between environmental pollution, energy use, and economic growth has been widely studied in the empirical literature. These empirical studies have utilized both panel and time series data to examine their relation.

Because environmental sustainability is driven by energy and economic growth, current research uses a variety of indicators to measure environmental pollution, including, CO_2, methane, nitroxide emissions, ecological footprint, and deforestation (Wang et al., 2017; Warsame et al., 2022). However, according to Pearson et al., (2017), carbon dioxide accounts for 72% of all greenhouse gas emissions and is the main contributor. This fact explains why CO_2 emissions have been utilized as a sign for environmental pollution across most of the literature (Wang et al., 2017; Ma, 2017; Kamran et al., 2019; Jun et al., 2021; and Salahuddin et al., [2017]). We precisely relevant empirical studies on energy usage, economic growth and environmental pollution nexus.

2.1. The Effect of Energy Consumption on Environmental Pollution

The first line of research examines the association between energy consumption and CO_2 emissions. The utilization of energy usage produces several greenhouse gases like CO_2 and SO_2. Several studies such as Kamran et al. (2019) in Pakistan, Cowan et al. (2014) in BRICS countries, and Xiangyu et al. (2021) in the United States of America (USA) explored energy consumption and environmental pollution nexus in different countries and reported that energy usage increases CO_2 emissions. While others have stated a negative link between energy usage and environmental pollution (Naz et al., 2018; Ma, 2017).

Khan et al. (2020) analysed the relationship between Pakistan's energy consumption and CO_2 emissions from 1965 to 2015. They discovered that Pakistan's energy consumption both temporarily and permanently boosts CO_2 emissions. Wang et al. (2017), examined the impact of energy utilization on CO_2 emissions in panel of 170 nations using a variety of panel econometric methodologies for the period 1980-2011. The empirical results revealed that there is a statistically significant positive association between the variables used over the long term and that there was a cointegration association among variables across all the examined nations. Moreover, Warsame and Sarkodie (2022) investigated the impact of economic growth and energy consumption on environmental degradation in Somalia between 1985 and 2017 using a nonlinear autoregressive distributed lag model (NARDL). They found that the long-term cointegration among the variables in Somalia. The causal inferences also revealed a one-way causal connection between increased energy consumption and environmental harm. Jacques and Keho (2016), investigated the association between energy usage, economic growth, and carbon dioxide emissions.) Considering a sampling of 12 Sub-Saharan African countries, the empirical findings vary across the countries. Long-term CO_2 emissions were found to be correlated with consumption of energy and economic expansion. In a panel study, Rahman (2020) has used FMOLS and DOLS approaches to examine the impact of energy use and economic growth on CO_2 emissions in the top 10 power-consuming nations. They showed that economic growth and energy consumption have a favourable and significant effect on CO_2 emissions in these countries. Ma (2017) examined the influence of energy use on carbon dioxide emissions from 1960 to 2014 for a panel of 11 Asian countries, they demonstrated that energy use has a detrimental impact on environmental quality in these sampled countries.

2.2. The Effect of Economic Growth on Environmental Degradation

The second theme of the literature focuses on the association between economic growth and CO_2 emissions. Economic growth stimulates standard of living and well-being of the people but at the cost of the environmental quality (Hussein et al., 2023). Ample previous studies have tested the well-known environmental Kuznets curve (EKC) hypothesis, which claims that the link between CO_2 emissions and economic growth resembles an inverted U-shaped of nonlinear curve. According to this hypothesis, a country's initial phase of growth is characterized by a positive relationship between these indicators; however, once it has reached a certain threshold of development, CO_2 emissions fall as GDP increases because the country can now afford to invest in efficient technologies. Several empirical studies such as Ara et al. (2015), Jun et al. (2021), Warsame and Sarkodie (2022), Wang et al. (2017), Rahman (2017), Hasnisah et al. (2019) have discovered that rising economic growth deteriorates environmental sustainability. Some others demonstrated a rise in growth rate reduces environmental pollution (Naz et al., 2018; Ma, 2017). In a sampling of 31 developing nations, Aye and Edoja (2017) investigated the connection between economic growth and CO_2 emissions. They reported that higher economic growth has a marginally favourable impact on CO_2 emissions, whereas in low-growth growth regimes, it has a marginally negative impact. The Environmental Kuznets Curve (EKC) theory is not valid in these sampled panel countries; instead, a U-shaped relationship is observed. Kamran et al. (2019) assessed the effects of globalization and economic growth on CO_2 emissions in Pakistan from 1971 to 2016 using a dynamic ARDL simulations model. They concluded that while economic growth in Pakistan has a short-term favourable effect on CO_2 emissions, it has long-term detrimental effects upon on the emissions. Xiangyu et al. (2021) studied the nonlinear influence of economic growth on CO_2 emissions. They revealed that strong reversion to the long-run equilibrium connection between economic growth and CO_2 emissions. In addition, economic growth has a favourable impact on lower-quantile carbon emissions while having a negative impact on higher-quantile emissions.

Naz et al. (2018) used time-series data from 1975 to 2016 to investigate the effects of renewable energy, GDP per capita, and FDI inflows on the decline of CO_2 emissions in Pakistan. The findings demonstrate that economic expansion and FDI inflows both contribute to an increase in CO_2 emissions during the study period, in addition, the results invalidate the EKC theory. Further, Jun et al. (2021) assessed the effect of non-renewable energy use, economic growth and globalization on CO_2 emissions for a few South Asian economies between 1985 and 2018. They revealed that a direct link between the usage of non-renewable energy and environmental pollution. Similarly, the results are consistent with the EKC theory in the South Asian region, which states that environmental pollution rises with economic growth in the early phases of development but starts to fall at a threshold point.

In light of the above literature, it could notice that both energy consumption and economic growth significantly hamper the quality of the environment as evidenced by the majority of the reviewed studies. However, several other studies have produced contradictory results-energy utilization and economic growth enhance environmental quality. This sheds the light on further studies on this topic in other countries are needed. Therefore, this research explores how environmental pollution in Kenya is affected by energy use and economic growth where there are no studies on this theme.

3. MATERIALS AND METHODS

3.1. Data Sources and Descriptions

Energy is essential for socioeconomic growth, yet relying on fossil fuels increases GHG emissions, which causes climate change and raises the earth's temperature. As a result, this study uses time series data spanning from 1990 to 2019 to explore the effects of energy usage and economic growth on environmental pollution in Kenya. Data availability determines the sampling period of the data. All the data is obtained from the World Bank. Environmental pollution, energy use, economic growth, and population growth were some of the variables we used. To eliminate heteroskedasticity, natural logarithms were applied to all variables. Different variables are used to measure environmental pollution up to this point, we use CO_2 emission as an indicator of environmental pollution instead of deforestation and GHG, which were previously used as a measure of environmental pollution.

Additionally, real GDP per capita is used as a stand-in for income level, whereas energy usage is quantified in energy use (kg oil equivalent per capita). It is asserted that the effects of human activity are connected to climate change. As a result, population growth is incorporated as a control variable to take into consideration how human activities affect environmental pollution. Table 1 presents data descriptions and sources whereas Figure 2 presents the trends of the sampled variables.

3.2. Econometric Methodology

We implement the ARDL technique developed by Pesaran et al. (2001) to fulfil the purpose of the study. It performs better than other cointegration techniques in several areas. In contrast to earlier cointegration methods, the ARDL method is fit for small sample sizes and does not require longer time-series data. Second, the ARDL could regress variables if they are not integrated at second difference I (2). Third, unlike the earlier techniques, it concurrently regresses long-run and short-run cointegration.

In modelling of the effect of energy consumption, economic growth, and population growth on environmental pollution, we followed the model specification of Ara et al. (2015); Warsame et al. (2022) and Kamran et al. (2019). Thus, our model is formulated as follows:

$$lnCO_{2t} = \beta_0 + \beta_1 lnEC_t + \beta_2 lnGDP_t + \beta_3 lnPG_t + \varepsilon_t \tag{1}$$

$lnCO_{2t}$ is the log of carbon dioxide emission in year t, $lnEC_t$ is the log of energy consumption in year t, $lnGDP_t$ is log of Gross domestic product in year t, PG is the log of population growth in year t, and ε_t is the disturbance term in time t.

This study's goal is to determine how long- and short-term impact of energy consumption, population growth and economic growth on environmental pollution in Kenya, the study rewrites equation (1) as long-run cointegration of ARDL equation as follows:

$$\begin{aligned}\Delta lnCO_{2t} = \alpha_0 + \sum\nolimits_{i=0}^{p} \Delta\alpha_1 lnCO_{2t-k} + \sum\nolimits_{i=0}^{p} \Delta\alpha_2 lnGDP_{t-k} \\ + \sum\nolimits_{i=0}^{p} \Delta\alpha_3 lnEC_{t-k} + \sum\nolimits_{i=0}^{p} \Delta\alpha_4 lnPG_{t-k} \\ + \beta_1 lnCO_{2t-1} + \beta_2 lnGDP_{t-1} + \beta_3 lnEC_{t-1} \\ + \beta_4 lnPG_{t-1} + + \varnothing ECT_{t-1} + \varepsilon_t\end{aligned} \tag{2}$$

Whereas α_{1-4} is the coefficient of short-tun, and α_0 is the intercept β_{1-4} denote the coefficient of long-run variables, Δ is the operator of first difference, p represents the number of lags and the ECT is the error correction term and ε_t is the error term. To ascertain the long-term cointegration between the dependent and independent

Figure 2: The trend in the data series. The abbreviations LCO_2, LEC, LGDP, LCP, and LPG stand for the natural logarithms of carbon dioxide emission, energy consumption, economic growth, and population growth, respectively

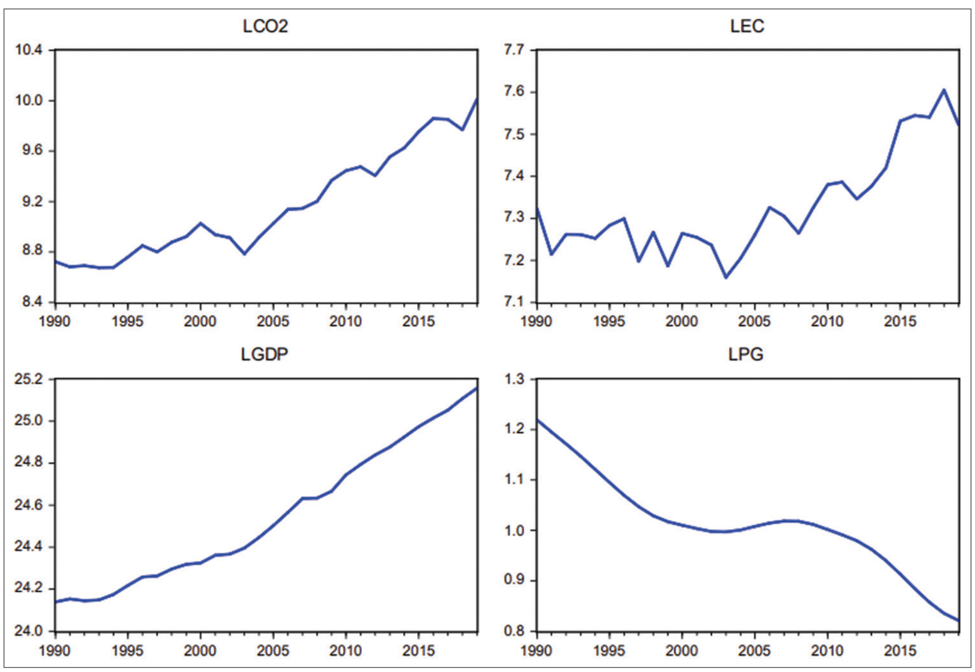


Table 1: Data sources and description

Variable	Code	Description	Source
Carbon dioxide emission	CO_2	Carbon dioxide emission kilotons	World Bank
Energy consumption	EC	Energy consumption per capita	World Bank
Gross domestic product	GDP	Economic growth	World Bank
Population growth	PG	Population growth	World Bank

variables, we regress equation (2) using the ordinary least square (OLS) method. The Wald F-statistic is used to compare the alternative hypothesis, which states that there is cointegration between the variables, to the null hypothesis that there is no cointegration among the variables in Kenya. The hypothesis is formulated as follows:

H_0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$| the null hypothesis ($H_0$): The indicators are not cointegrated.

H_a: $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq 0$| the alternative hypothesis (H_a): The indicators are cointegrated.

4. EMPIRICAL ANALYSIS AND DISCUSSION

Table 2 displays summary statistics of the variables. Results presented in Table 1 report mean values of carbon dioxide emissions (9.16), energy consumption (7.3), economic growth (24.5), and population growth (1). Economic growth and carbon dioxide emissions have the highest maximum values of 25 and 10, respectively. Carbon dioxide emissions have the highest standard deviation (0.41), implying that its values are scattered compared to other variables. It is notable that all the variables are positively skewed. The variables are normally and identically distributed as shown by the insignificant probability value of the Jarque-Bera. Besides, the result of the correlation is also presented in Table 1. Energy consumption and economic growth are positively associated with carbon dioxide emissions, whereas population growth is negatively correlated with carbon dioxide emissions.

Table 2: Descriptive statistics

	LCO_2	LEC	LGDP	LPG
Mean	9.161878	7.326687	24.54965	1.012557
Median	9.026418	7.291203	24.47409	1.008908
Maximum	10.01144	7.605081	25.15723	1.219160
Minimum	8.675905	7.159451	24.13876	0.820989
SD	0.417322	0.118459	0.328467	0.096795
Skewness	0.548183	0.911282	0.375970	0.133184
Kurtosis	1.970850	2.852028	1.789621	3.017283
Jarque-Bera	2.826463	4.179546	2.538041	0.089063
Probability	0.243356	0.123715	0.281107	0.956445
Correlation				
LCO_2	1			
LEC	0.894	1		
LGDP	0.983	0.854	1	
LPG	−0.872	−0.704	−0.891	1

Energy consumption and economic growth have a positive relationship. But energy consumption and population growth are negatively related. Finally, there is a negative correlation between population growth and economic growth.

4.1. Unit Root

The objective of time series analysis is to validate that the indicators are stationary. Because the variables might suffer from a unit root problem that could produce inaccurate results. To find out if the variables may have this issue, the ADF and PP tests are utilized. The null hypothesis of ADF and PP supports the existence of a unit root problem, although the alternative hypothesis validates the lack of a unit root problem. If the variable's t-statistic is higher than the crucial t-value assigned to it, we deny the null hypothesis that the data are non-stationary and do not accept the alternative hypothesis that the data are stationary. According to the findings of the tests shown in Table 3, all variables which were tested are stationary at the first difference level (I (1). Yet, both unit root tests (PP and ADF) show that the key factors are stationary at the first difference, failing to reject the alternative hypothesis while rejecting the null hypothesis of the nonstationary. The absence of unit root issues in our data-shown by ADF and PP-indicates that the ARDL bound test is appropriate for the characteristics of the data.

We investigate the existence of long run cointegration among the sampled variables after confirming that none of the indicators are integrated at second order I (2). The bound test result is reported in Table 4. The Wald F-statistics was found to be higher than the upper bound critical value, indicating the presence of the long run among the variables of interest.

The long run coefficient elasticities are examined and its result is presented in Table 5. It was found that energy consumption and economic growth are statistically significant, whereas population growth is statistically insignificant. Environmental pollution rises by 0.79% for every 1% increase in energy consumption. Similarly, a 1% rise in economic growth leads to environmental pollution increasing by 1% in the long run.

Regarding the energy and CO_2 emissions nexus, this study discovered that energy consumption increases CO_2 emissions in Kenya. This finding is supported by Kamran et al. (2019) in Pakistan., Cowan et al. (2014) in BRICS countries, and Xiangyu et al. (2021) in the United States of America (USA). Recent

Table 3: Unit root tests

Variable	ADF		PP	
	Level intercept	Intercept and trend	Level intercept	Intercept and trend
LCO2	0.9946	0.5450	1.0000	0.6941
LEC	0.8134	0.2340	0.8782	0.2543
LGDP	1.0000	0.5786	1.0000	0.4914
LPG	0.5891	0.0377*	0.7591	0.6551
	First difference intercept	Intercept and trend	First difference intercept	Intercept and trend
LCO_2	0.0004***	0.0024***	0.0005***	0.0000***
LEC	0.0000***	0.0071***	0.0000***	0.0000***
LGDP	0.0196***	0.0081***	0.0196***	0.0093***
LPG	0.0003***	0.0001***	0.5211	0.8418

***, **, and * show significance level at 10%, 5%, and 1%, respectively

Table 4: Bounds test

K	(3)	
F-statistic	5.046312	
Significance	I (0) Bound	Critical value bounds
		(I) 1 Bound
10%	2.37	3.2
5%	2.79	3.67
2.5%	3.15	4.08
1%	3.65	4.66

Table 5: Long and short-run results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Long run result				
LEC	0.797	0.401	1.984	0.0604
LGDP	1.004	0.199	5.023	0.0001
LPG	−0.172	0.502	−0.343	0.7350
Constant	−21.108	3.779	−5.584	0.0000
Short run result				
Δ(LEC)	1.004	0.165	6.059	0.0000
Δ(LGDP)	0.172	0.304	0.565	0.5784
Δ(LPG)	−0.529	0.586	−0.903	0.3767
ECT (−1)	−0.613	0.166	−3.687	0.0014

Table 6: Diagnostic rests

Serial correlation	0.849 (0.795)
Heteroskedasticity test	2.291 (0.083)
Normality test	0.531 (0.767)
Reset test	0.041 (0.842)
Adjusted R^2	0.984

studies have shown that using energy harms environmental quality by causing CO_2 emissions, which in turn increases pollution, whereas renewable energy reduces environmental pollution (Ali et al., 2022) additionally, in terms of how economic growth affects the environment, environmental degradation is positively and statistically impacted by economic growth. According to the findings, CO_2 emissions increase when Kenya's economy increases via industrialization, agriculture production or any other economic activity expansion. This finding is in line with other findings such as Khan et al. (2020) in Pakistan, Ara et al. (2015) n Malaysia, Jun et al. (2021) in south Asia economies, (Warsame and Sarkodie, 2022), in Somalia (Wang et al., 2017) in a panel with different income countries.

On the contrary, several previous studies indicated that higher energy consumption and economic growth seem to reduce environmental pollution. For instance, (Naz et al., 2018), Ma (2017). Asumadu-Sarkodie and Owusu 2016. They stated that CO_2 emissions are decreased by both industrial development and economic growth. These mixed findings might be attributed to the various methods employed and geography of under study countries.

Furthermore, the short-run dynamic effect is estimated along with the error correction term (ECT). Energy consumption is the only significant explanatory variable that exerts a significant positive effect on environmental pollution in the short run. A 1% increase in energy consumption results in environmental pollution increasing by about 1% in the short run. Moreover, the ECT is statistically significant and has a negative coefficient, implying that the model makes convergence rather than divergence. Any disequilibrium that occurs in the environmental pollution in the short run is adjusted 61% by the scrutinized variables in the long run annually.

Figure 3: CUSUM test

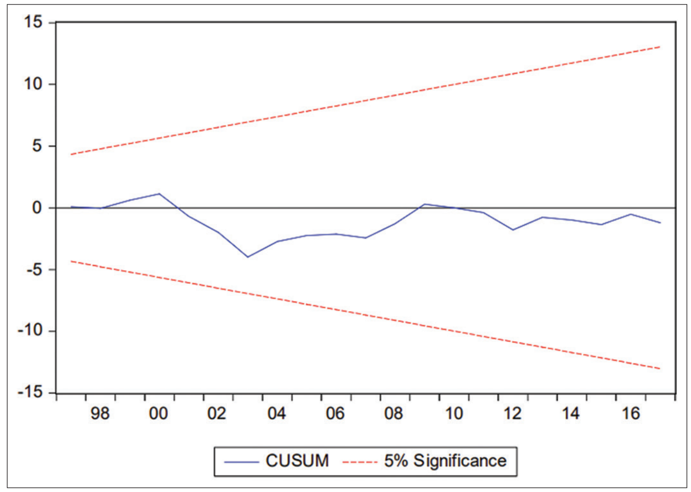
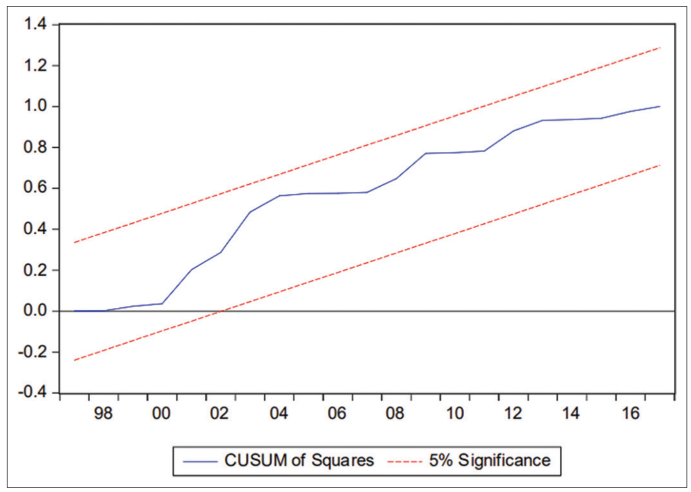


Figure 4: CUSUM square test



The bound result is void and null if there is a diagnostic problem in the result of the study. Hence, to find out robust results, we carry out a number of diagnostic testing, including serial correlation, heteroskedasticity, model misspecification, and model stability tests. The diagnostic test results reported in Table 6 revealed that the model is free from all the diagnostic issue. In addition, there is no structural break in the data as shown in Figures 3 and 4 CUSUM and CUSUM square tests.

5. CONCLUSIONS AND POLICY IMPLICATIONS

Energy is a crucial component of productivity and is regarded as an engine for the economic growth. Nevertheless, it was observed that increased economic activity and energy consumption are harming the environment. This study examined the impact of energy consumption, and economic growth on CO_2 emissions in Kenya from 1990 to 2019. The cointegration of the series is confirmed by applying autoregressive distributed lag (ARDL). According to the ARDL result, energy consumption and economic growth reduces environmental quality by increasing CO_2 emissions in Kenya. However, population growth has no effect on environmental deterioration.

To achieve economic sustainability in country, environmental policies should be implemented by the government to help lower pollutant emissions. In addition to encouraging cleaner energy sources, Kenyan policymakers should encourage adapting various technological behavioural, and other measures to increase the overall energy efficiency of its economies. A steady supply of clean electricity should be part of efforts to lower CO_2 emissions in order to reduce the use of fuel generators. This will lead in high levels of electricity production and low levels of CO_2 emissions. More importantly, massive investments should be made in the development of the power infrastructure in this regard. Furthermore, agriculture production is the key driver of Kenya's economic growth. Our findings support the idea that economic growth accelerates environmental degradation. By decreasing wasteful farming expansion and overgrazing, contemporary technologies, improved animal grazing land policies, and sound agricultural and sustainable cultivation methods will help to foster sustainable economic growth and better environment.

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