Sustainable Energy Development: The Role of Governance and Investment in Sub-Saharan Africa

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Abstract
The Sub-Sahara Africa is replete of developing economies whose energy demand is rising significantly. However, her high dependence on fossil fuels is quite alarming and dangerous to the sustainable development. Considering the significance of renewable energy to achieving sustainable development, this study investigated the impact of governance and investment on sustainable development in the Sub-Saharan Africa. The Augmented Dickey Fuller (ADF) test was used to test for stationarity, the Granger causality and the Fully Modified Ordinary Least Square (FMOLS) techniques for causality and co-integration processes respectively. The result indicated that there is no causality between sustainable development and governance and investment in the region between the considered period (1996 to 2019). However, four of the six governance indicators and foreign direct investment (FDI) indicates a negative long period relationship with sustainable energy development. Contrariwise, "the rule of law" shows a positive long period interaction with sustainable energy development. Government and policy makers are required to make deliberate effort in improving every aspect of governance for sustainable development in the Sub-Saharan Africa.
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I.   Introduction

About 940 million people representing 13 percent of the global population had no access to electricity in 2016. This was recorded following a fall from 952 million in 2015. Although this population is decreasing, the population is still high if the 2030 universal access to electricity would be achieved (Ritchie & Roser, 2020). Also, theUnited Nation Development Programme(UNDP) stated that 1 in 7 people lack access to electricity in emerging countries, most of which are residing in rural communities. The regional distribution of this class of people indicates that in 2016, the Sub-Saharan Africa host the highest proportion with about 63 percent (Ritchie & Roser, 2020). Epileptic electricity supply reduces probability of employment by about 35 percent in a community. This reduction in probability affects non-farm industry by 53 percent, high-skilled jobs by 27 percent which defies expectation. Poor electricity is expected to affects sophisticated jobs, since they rely on machines and complex systems to operate. However, the opposite is the case (Patel Nirav, 2019). This implies that more unskilled and low skilled jobs which is rampant in the Sub-Saharan Africa (Sean Fleming, 2019), can be generated than high-skilled jobs which do not have quantity-matched applicants. More so, farm-related jobs are also really affected. No economy can function without energy. It is necessitated in adequate quantity and quality to meet fundamental human needs, and also to aid transportation, agricultural, and industrial exercises, all of which are essential to economic development (Raman *et al.*, 2018). There is almost no sector of the economy that does not rely on energy in some way, either directly or indirectly. The International Energy Agency (IEA) defines energy security as the "provision of uninterrupted energy sources at a reasonable cost" (World Economic Forum, 2016). Although the idea of energy security is multifaceted and encompasses a variety of viewpoints (Campos *et al.*, 2017).
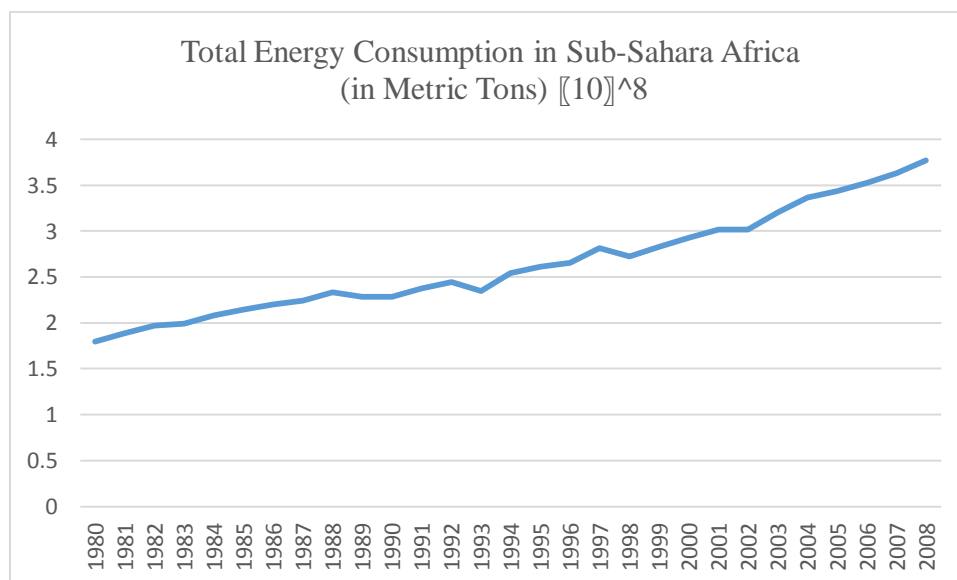
Figure 1: Total Energy Consumption (in Metric Tons) in Sub Sahara Africa
Source: (African Development Bank)

Global demand for petroleum as a source of energy is projected to rise to 103 million barrels per day in the year 2030, from 92 million barrels per day in 2020 (Meierding & Emily, 2011). As indicated in Figure 1 above, total energy consumption has been increasing significantly over the years. A whopping proportion (80 percent) of the Sub-Sahara Africa basic energy request is from fossil biomass: charcoal, fuel-wood, animal wastes (Meierding & Emily, 2011), exclusive of South Africa and fossils. Fossil fuels has been the biggest product in the Sub Sahara African export basket till lately, when a sharp declined was recorded. From 1995 to 2018, hydrocarbon fossil fuels (48.5%) and Mineral Energy Materials (23%) accounted for nearly 70% of Sub-Saharan Africa's export worth (Holtz Leo & Heitzig Chris, 2021). In 2015, fossil fuel-powered generation rose by 15 percent, and an overall 22 percent increment in the last ten years (U.S Energy Information Administration, 2018). In 2020, the proportion of fossil fuels in global energy mix is about 80 percent while 20 percent accounts for non-fossil fuels. This has serious implications on the global environment and the economy. 74 per cent of United States emissions in 2019 were fossil-induced emissions (Environmental and Energy Study Institute, 2021). Fossil fuel for energy use causes various disadvantages, one of which is the excess death rate. Discharge of the by-product of incomplete combustions in engines, energy generation and such likes are the cause of this deaths.This discharge depletes the earth's protecting ozone layer, hence, causing global warming. To mitigate this effect, the Paris agreement between some countries was then aimed at limiting the change in temperature of the earth's atmosphere to a $1.5^0C \text{ to } 2^0C$ range (Lelieveld et al., 2019).

Global population is projected to be over 9.7 billion by 2050 (United Nations Department of Economic and Social Affairs, 2019), while Sub-Sahara African population should be over 2.2 billion, with about 99 percent increment (Suzuki Emi, 2019). The needs of these future generation must be considered in the expense of present resources. This is the intent of sustainable development. Hence, sustainable energy development is the development of the energy that can satisfy current generations' demands without jeopardizing future generations' capacity to achieve their own. It sustains socio-economically and environmentally, therefore must be clean and affordable. This kind of energy is also able to conserve energy with efficiency and curb wastages. To meet energy demands, mitigate the effect of emissions from fossils, and to achieve sustainable energy, renewable energy sources such a solar, wind, geothermal, water and so on are widely acceptable because of their renewability, inexhaustibility, pureness, and abundance.

The way a country's government is selected, measured, and replaced; the government's capability to effectively chart out and implement good policies; and the respect expatriates and states have for entities that oversee socio-economic connections are all mirrored in the culture and systems for which authority is exercised (Kaufmann *et al*., 2010). To maintain the profits and limit the losses of economic development, good culture and governance play a key role. Governance is based on six pillars, according to (Kaufmann *et al*., 2010). They are the Rule of Law, Government Effectiveness, Corruption Control, Regulatory Quality, Voice and Accountability, Political Stability, and Absence of Violence/Terrorism. They are regarded as the World Governance Index used in measuring the quality of governance.

Foreign Direct Investment (FDI) inflows to Africa increased to US$46 billion in 2018, following a decline in two preceding years. In 2019, FDI in Sub-Sahara Africa increased by 13 percent, amounting to US$32 billion. These values are signifying that Africa and more significantly, the Sub-Sahara Africa is gaining

the interest of foreign investors. During these times, there was a global decline. This may also affect energy (renewable or fossils) in some ways. (Organization for Economic Cooperation and Development, 2002) ascertained that FDI has the capability of causing high growth rate than local investment in emerging economies. There are also various factors that interacts with the FDI to generate increment in economic growth.

In a bid to satisfy our present energy needs, as well as the needs of future generation, examining the role of governance is essential. Hence, this study aims to investigate the influence of governance indicators and foreign direct investment on the achievement a clean, affordable, efficient and sustainable energy development in the Sub Saharan Africa.

II.   Literature Review

2.1 Indicators of Governance

The six indicators of governance (the Rule of Law, Government Effectiveness, Control of Corruption, Regulatory Quality, Voice and Accountability, and Political Stability andAbsence of Violence/Terrorism) are described and decomposed in (Kaufmann *et al.*, 2010) and adopted by the World Bank as measures of the quality of governance. Considering about 28 countries in the Sub Saharan Africa, (Fayissa & Nsiah, 2013) investigated the role of governance on economic development between 1990 and 2004. The six dimensions of the World governance index developed by (Kaufmann *et al.*, 2010) were proxies for governance, while the Gross Domestic Product (GDP) per capita represented economic growth. The quantile regression technique revealed that regardless of the proxy for good governance utilised, the outcomes of the various estimated models imply that effective governance has a positive and considerable influence on development. Also, the influence of quality governance varies across the countries, depending on the conditional distribution of Gross Domestic Product per capita. The role of governance on development is also attributed to the countries' level of income. Renewables are acceptable alternatives to fossil fuels which are proven to cause high quantity of emissions, especially the carbon dioxide. These governance metrics were also used in a non-parametric investigation of the link between carbon dioxide emissions and the quality of governance in the G-20 countries in (Halkos&Tzeremes, 2013). The research covers the years 1996 through 2010. This link was shown to be very non-linear, and the number of governance indicators differs significantly amongst the countries studied. As a result, the connection was not linear and was not consistent among countries throughout the study period. In Germany, Italy, France, and the United Kingdom, government effectiveness (GE), corruption control (CC), and regulatory quality (RQ) were discovered to be the only stimuli to carbon dioxide emissions.Political stability influences CO_2levels in Russia, India, South Africa, and Turkey, whereas the Rule of Law and Voice and Accountability have no effect on CO_2emissions in Australia, Canada, Saudi Arabia, or the United States. Though the discovered variety is susceptible to the peculiarities of each country's geographical and growth characteristics, the study also suggested that enhancing governance quality throughout the board may not always lead to a decline in carbon dioxide emissions. Following the Governor's commitment in December 2015, (Milhorance & Bursztyn, 2018)evaluated the effectiveness of the government's structural strategies to minimize carbon emissions in Brazil's most emitting state, Mato Grosso. The Produce, Conserve, and Include (PCI) strategy was established, firstly, to integrate and organize ideas and crucial industry players; secondly, to produce knowledge and government; thirdly, to assist in soliciting donations and managing assets; fourthly, support projects and agendas; and lastly, to encourage communication, transparency, and the inclusion of crucial industry players. The PCI approach for lowering emissions in the state describes the citizen engagement, private industry participants, and government entities that fit with the Voice and Accountability, institutional governance, and corruption indicators of the World Bank Governance Index. Because of sustainable and stabilized aims for lower emissions, the strategy was determined to have a large ability to incorporate innovative governance.

2.2 Renewable Energy and Growth

From (Hung-Pin, 2014)'s study of the connection between renewables consumption and economic development in nine Organization for Economic Cooperation and Development countries, namely Spain, Denmark, the United Kingdom, Portugal, Germany, Italy, Japan, France, and the United States of America. Failing the unit root test as criteria for the Autoregressive Distributed Lag technique, Denmark and Portugal were dropped in the study. ARDL showed that a long-period relationship exists between renewable energy usage and economic growth in all individual countries. However, the granger causality tests revealed that: both Spain and France show no distinct long-period nor balanced connection between renewables usage and economic development, one-way directional in a long period relationship exist between renewable energy consumption in Germany, Italy, and the United Kingdom.

According to (Singh *et al.*, 2019), with evidence from a study conducted on 20 developed and developing countries between 1995 and 2016, utilizing Fully Modified Ordinary Least Square (FMOLS) estimation technique, an increment in renewable energy causes a 0.07 percent increase in output in developed

economies, but a 0.05 percent increase in developing economies. This implies that developed economies are more influenced positively by renewable energy development than developing economies. Using the Renewable Energy Country attractive index with evidences from 38 economies, gathered over the period of 1980 to 2018, (Reddy *et al*., 2020) reexamined the effect of renewable energy consumption on economic development. Using the Dynamic Ordinary Least Square (DOLS), the Fully Modified Ordinary Least Square (FMOLS) and homogeneous tests of causality. The study reveals a long-period inter-relationship between renewable energy consumption. Furthermore, about 58 percent of the economies considered are migrating from fossils to renewables. Germany, Ukraine Finland, Slovenia, the Netherlands, Bulgaria, Poland, Australia, Korea Republic, Mexico, Chile, Japan, Greece, Peru, China, Ireland, Kenya, Brazil, Austria, Denmark, Sweden, and the Czech Republic exhibited a positive and notable renewable-growth relationship. India, France, Canada, Spain, Norway, Turkey and the United Kingdom exhibits a negative and significant relationship, while the United States, Belgium, South Africa, Romania, Thailand, Morocco, Portugal, Italy, and Israel exhibits an insignificant interaction. However, the countries with the negative interaction, are majorly those with high fossils natural resources. Besides, the availability of renewable options, the importance of governance in achieving sustainable energy through emission free means is not small as governments such as Brazil, Japan, Australia, Ireland and other governments, fund energy project on large scales, set reasonable renewable energy targets and are making contractual agreements to achieve them.

2.3   Foreign Direct Investment and Growth

(Kowalewski & Weresa, 2008) tested the impact of the Foreign Direct Investment (FDI) on growth contribution of three (primary, secondary, and tertiary) sectors of the economy in 26 transiting economies between 1990 and 2006 using the Feasible Generalized Least Square (FGLS) regression technique. To capture the effect of growth in these three sectors, the GDP per capita and the Gross Value Added (GVA) was used. A strong connection was found between FDI inflows and a long-term economic growth. Also, the study revealed that FDI inflows influences growth in the industries than in the service sectors. In all these, government size has a negative influence on growth, but it is not significant all the time.

The place of foreign investment in building an economy, providing employment, improving export abilities, and exercising mastery of advanced administrative methods have differing patterns in developed and developing economies. The function of foreign investment in developed countries is not significant, while it is very significant in developing economies (Baymuratova *et al*., 2020). Foreign investment in developed countries are targeted at high-capacity sectors whose products are investment goods. On the other hand, in developing economies, foreign investment are targeted at goods consumed by the recipient countries.

The World Governance Index (WGI) developed and discussed by (Kaufmann *et al*., 2010) and adopted by the World Bank is widely accepted in literature to measure the quality of governance. Also, renewable energy consumption which is remedy to greenhouse gases, and a route to achieving sustainable energy is discovered to influence some economies. This implies that these relationships vary across regions and countries based on the nature of governance. The role of governance on renewable and sustainable energy has not however been studied in the Sub-Saharan Africa. This study therefore aims to fill in on this.

III.   Methods and Materials

The time series data gathered on renewable energy consumption (percentage of total final energy consumption) related to all renewable sources, Foreign Direct Investment - net inflows (percentage of GDP), and World Governance Indices (WGI) related to the Rule of Law, Government Effectiveness, Control of Corruption, Regulatory Quality, Voice and Accountability, Political Stability, and Absence of Violence/Terrorism, between the period of 1996 and 2019, from The African Development Bank database (African Development Bank).

3.1   Unit Root Test

The series $\{x_t\}$ must be stationary, and errors must possess a zero mean and bounded variance, according to the classical time series model's requirements. Classical time series modelling without affirming stationarity will result in spurious/false regression (Granger & Newbold, 1974). The t-statistic of the λ_2 coefficient of the given regression below is known as the Augmented Dickey-Fuller test (Dickey & Fuller, 1979):

$$\Delta x_t = \lambda_0 + \lambda_1 t + \lambda_2 x_{t-1} + \sum_{i=1}^{n} \eta_i \Delta x_{t-1} + \mu_t, \qquad (1)$$

Where, Δ *is the first differencing operator, having n numbers of lags*, μ_t is a stationary stochastic error balancing the autocorrelation error.

The null hypothesis, H_0: x_t is non-stationary, in essence, $\lambda_2 = 0$; and H_1: $\lambda_2 < 0$.

3.2 Fully Modified Ordinary Least Square (FMOLS)

Fully Modified Ordinary Least Square is a non-parametric method to serial correlation analysis. (Phillips & Hansen, 1990)developed the fully modified least squares (FM-OLS) regression to maximizing the value of the estimates derived from co-integrating regressions.

The model is described thus:

$$Y_t = \beta_0 + \vec{\beta} X + \sum_{j=-q}^{p} \vec{d}_j \Delta X_{t-j} + u_t \qquad (2)$$

$Y_t = Dependent\ Variable$ $\qquad\qquad X = Matrix\ of\ Independent\ Variables$
$\vec{\beta} = the\ Co - integrating\ Vector$ $\qquad\qquad p = lag\ length$
$q = lead\ length$

3.3 Granger Causality Test

Granger causality is an economic test that determines if an independent variable may be effectively used to forecast the dependent variable. The test was introduced by (Granger, 1969)

$$y_t = c + \sum_{j=0}^{\infty} b_j x_{t-j} + \sum_{j=1}^{\infty} d_j x_{t+j} + e_t \qquad (3)$$

Where, $E(e_t x_\tau) = 0$ for all t and τ. Then y fails to Granger-cause x if and only if $d_j = 0\ for\ j = 1,2,...$
The independent variables in X are described in Table 1:

Table 1: Description of the independent variables

Abbreviation	Description of Variable	Type of Indicator
RL	Rule of Law	World Governance Index
GE	Government Effectiveness	World Governance Index
CC	Control of Corruption	World Governance Index
RQ	Regulatory Quality	World Governance Index
VA	Voice and Accountability	World Governance Index
PSAV	Political Stability and Absence of Violence/Terrorism	World Governance Index
FDI	Foreign Direct Investment	World Development Index

However, the dependent variable in this study is renewable energy consumption.

Table 2: Description of the dependent variables

Abbreviation	Variable	Type of Indicator
REC	Renewable Energy Consumption	World Development Index

IV. Results

4.1 Augmented Dickey Fuller

Table 3: Augmented Dickey Fuller test for the Rule of Law

RULE OF LAW				
Augmented Dickey-Fuller Test				
alternative: Stationary				
	No differencing		**At first Differencing**	
lag	ADF	P value	ADF	P value
2	-3.1801	0.1228	-3.6805	0.377

In Table 3, considering the p values of the Augmented Dickey Fuller's test was 0.1228 at no differencing which is greater than the 0.05 significance level. This is reflecting that the series (Rule of Law) is non stationary. However, it became stationary after the first differencing.

Table 4: Augmented Dickey Fuller test for the Control of Corruption

CONTROL OF CORRUPTION				
Augmented Dickey-Fuller Test				
Alternative: Stationary				
	No differencing		**At first Differencing**	
lag	ADF	P value	ADF	P value
2	-3.4474	0.0712	-4.3567	0.01081

Table 5: Augmented Dickey Fuller test for Government Effectiveness

GOVERNMENT EFFECTIVENESS				
Augmented Dickey-Fuller Test				
Alternative: Stationary				
	No differencing		**At first Differencing**	
lag	ADF	P value	ADF	P value
2	-3.0609	0.1682	-4.1318	0.01866

Tables 4 and 5 also indicates that Control of Corruption is also non-stationary, but stationary after first differencing.

REGULATORY QUALITY						
Augmented Dickey-Fuller Test						
Alternative: Stationary						
	No differencing		**First differencing**		**Second differencing**	
lag	ADF	P value	ADF	P value	ADF	P value
2	-2.4471	0.4021	-2.1809	0.5035	-2.7455	0.2884

Table 6: Augmented Dickey Fuller test for Regulatory Quality

The Augmented Dickey fuller test results for the regulatory quality of governance displayed in Table 6 shows that is also non-stationary. Even after the first and second differencing, it was still non-stationary.

Table 7: Augmented Dickey Fuller test for Political Stability and Absence of Violence/Terrorism

POLITICAL STABILITY AND ABSENCE OF VIOLENCE/TERRORISM						
Augmented Dickey-Fuller Test						
alternative: stationary						
	No differencing		**At First Differencing**		**Second differencing**	
lag	ADF	P value	ADF	P value	ADF	P value
2	-1.7851	0.6542	-2.4099	0.4162	-3.6778	0.04444

Table 7 displays the Augmented Dickey Fuller test outcomes for the Political Stability and Absence of Violence/Terrorism. Non-stationary was only achieved after the second differencing.
This trend also applies to Table 8, 9 and 10, which show that Voice of Accountability, Foreign Direct Investment and Renewable Energy Consumption were only stationary after the second differencing.

Table 8: Augmented Dickey Fuller test for Voice and Accountability

VOICE AND ACCOUNTABILITY
Augmented Dickey-Fuller Test
alternative: stationary

lag	No differencing		First differencing		Second differencing	
	ADF	P value	ADF	P value	ADF	P value
2	-2.1765	0.5052	-2.5248	0.3725	-4.3369	0.0115

Table 9: Augmented Dickey Fuller test for Foreign Direct Investment

FOREIGN DIRECT INVESTMENT						
Augmented Dickey-Fuller Test						
Alternative: Stationary						
	No differencing		First differencing		Second differencing	
lag	ADF	P value	ADF	P value	ADF	P value
2	-0.5968	0.9669	-2.726	0.2958	-6.0106	0.01

Table 10: Augmented Dickey Fuller test for Renewable Energy Consumption

RENEWABLE ENERGY CONSUMPTION						
Augmented Dickey-Fuller Test						
Alternative: Stationary						
	No differencing		First differencing		Second differencing	
lag	ADF	P value	ADF	P value	ADF	P value
2	-2.9858	0.1969	-3.5044	0.06327	-4.0351	0.02203

Differencing is a method for transforming a non-stationary time series data into a stationary one of which reasons is to avoid spurious modelling. In order to carry out most time series study, it is important to be sure the series are stationary. In this case, a requirement for Granger causality is stationarity. This mandated the need for transformation before Granger causality done in the subsequent section. Since differencing could not be achieved for Regulatory Quality, it was not considered for Granger causality. Another trend discovered is that the differencing level do stationarity varies across the variables. For example, Renewable Energy Consumption, Voice of Accountability, and Foreign Direct Investment were stationary at the second level, whereas, Rule of Law, Government Effectiveness, and Control of Corruption were only stationary at first differencing. Another requirement for Granger causality test is that the leaves of the two variables mist be the same. Hence, only the three variables having the same level as the target variables were considered.

4.2 Granger Causality Tests
Table 11: Granger Causality test results

	Variables	F-Statistic	p- value
1	REC to PSAV	0.0259	0.994
2	PSAV to REC	0.7546	0.5407
3	REC to VA	0.3302	0.8037
4	VA to REC	2.2046	0.1403
5	REC to FDI	2.5485	0.1048
6	FDI to REC	0.2438	0.8641

Significance codes: 0 '*'   0.001 '**'   0.01 '*'   0.05 '.' 0.1 ' '   1**
Null Hypothesis is: **X does not Granger-cause Y.**
Alternative Hypothesis: **X Granger-causes Y.**
Table 11 presents the results of the Granger causality test. From the first row, the p-value for whether Renewable Energy Consumption causes Political Stability and Absence of Violence and Terrorism is 0.994 which is greater than the 0.05 significance level. Hence, we conclude that there is not enough evidence to reject the null hypothesis. Therefore, Renewable Energy Consumption does not cause Political Stability and Absence of Violence and Terrorism in the Sub-Sahara Africa. The same thing is the return relationship.

All other considered variables such as the Renewable Energy Consumption to Voice and Accountability, to Foreign Direct Investment and vice versa in both cases also indicates a p-value greater than the significance level. It indicates that they all do not Granger cause themselves.

4.3 Fully Modified Ordinary Least Square
FM-OLS: Coefficients

Table 12: Fully Modified Ordinary Least Square outcomes

Variables	Estimates	Standard Error	t value	P value
Control of Corruption	-6.7796e-24	1.9930e-24	-3.4018	0.003646 **
Government Effectiveness	-1.2966e-23	3.8134e-24	-3.4000	0.003660 **
Political Stability and Absence of Violence/Terrorism	-2.8589e-23	8.4084e-24	-3.4000	0.003660 **
Rule of Law	2.5732e-24	7.5683e-25	3.4000	0.003660 **
Voice and Accountability	-6.1251e-24	1.8015e-24	-3.4000	0.003660 **
Foreign Direct Investment	-1.8632e-11	5.4800e-12	-3.4000	0.003660 **

Significance codes: 0 '*'   0.001 '**'   0.01 '*' 0.05 '.' 0.1 ' '   1**

Table 12 displays the coefficients for the Fully Modified Ordinary Least Square (FMOLS).The table indicates there exist a negative long-run interaction between Renewable Energy Consumption and each of the following: Control of Corruption, Government effectiveness, Political Stability and Absence of Violence, Voice and Accountability, Foreign Direct Investment. However, the Rule of Law has a positive long term interaction with Renewable Energy Consumption. Furthermore, the p values for each of the variables is significant at 5 percent level of significance, even at 0.1 percent.

Since governance indices for the region is negative, in essence, representing bad governance. The higher it goes, the worse it becomes. Also from Table 12,6.7796e-24 increase in bad control of corruption will produce 1 percent reduction in the percentage of renewable energy consumption in the total energy consumption. 1.2966e-23 increase in government ineffectiveness index will produce a 1 percent reduction in the percentage of renewable energy consumption in the total energy consumption. 6.1251e-24 increase in bad voice and accountability governance index will produce 1 percent reduction in the percentage of renewable energy consumption in the total energy consumption. Likewise, 2.8589e-23 drop in political stability and Absence of violence/terrorism produced 1 percent reduction in the percentage of renewable energy consumption in the total energy consumption in the Sub-Saharan Africa. However, 2.5732e-24 increase in bad rule of law produces 1 percent increase in the percentage of renewable energy consumption in the total energy consumption.

V.   Conclusion

This study investigated the impact of governance and foreign direct investment on renewable energy consumption as proxy for sustainable energy development in Sub-Saharan Africa. The Augmented Dickey Fuller (ADF) unit root test, the Granger causality test and the Fully Modified Ordinary Least Square (FMOLS) co-integration tests were used to achieve this aim. Ultimately, the results show that there is no causality between sustainable energy development and any of Foreign Direct Investment (FDI), Voice and Accountability, and Political Stability and Absence of Violence/Terrorism.

Control of Corruption, Government Effectiveness, Voice and Accountability, Political Stability have a negatively long period interaction with sustainable energy development. Implying that increase in bad control of corruption, bad government effectiveness, bad voice and accountability and political instability and presence of violence and terrorism will reduce sustainable energy development. On the contrary, increase in FDI seems to reduce sustainable energy development. To meet sustainable development goals and particularly, future energy demands, government and policy makers in Sub-Saharan Africa should endeavor to improve on all the aspect measured by these governance indicators.

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