

## Renewable energy consumption, sustainable development and food security nexus: Insights from Nigeria

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### Abstract

*Nigeria is poised to lead Africa in the drive to achieve increased renewable energy consumption and food security. It is also one of the leading fossil fuel and mineral deposit locations in the world, as well as the largest oil producer in Africa. This implied that there are high levels of mineral and fossil fuel depletions, which set the stage for the consideration of adjusted net savings. This study aims to investigate the relationship among renewable energy consumption, food security and Adjusted Net Savings (ANS) in Nigeria. The study will use secondary data from 1990 to 2019 to examine the central, correlation, and dispersion behavior of the variables considered in this study, and provide background information and recommendations for future studies. The findings of this study will provide insights into the effectiveness of Nigeria's policies and programs aimed at promoting sustainable development and improving food security, with potential implications for other developing countries facing similar challenges.*

**Keywords:** *Renewable Energy Consumption, Food Security, Cereal Yield, Adjusted Net Savings, Sustainable Development, and Nigeria*

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### 1. Introduction

Two crucial challenges that are intimately related are food security and sustainable development. Promoting sustainable development is dependent on ensuring food security, and long-term food security depends on sustainable development practices. Nigeria faces the problem of concurrently achieving sustainable growth and food security, just like many other emerging nations. Nigeria has improved food security and promoted sustainable development during the past few years. However, it is still unclear how much these initiatives have contributed to sustainable development as determined by adjusted net savings.

With an estimated population of nearly 200 million, Nigeria is the most populous nation in Africa (Olawejaju, 2021; Olowe, 2021). Over 60% of the population in Nigeria are employed in the the agricultural sector, which accounts for 21% of the nation's GDP (Osabohien, Matthew, Gershon, Ogunbiyi& Nwosu, 2019; Olowe, 2021).

Despite this, Nigeria still has a long way to go before food security is achieved. The World Food Programme (WFP) estimates that 4.4 million Nigerians are severely food insecure and another 3.2 million are at risk of becoming food insecure (Ayinde, Otekunrin, Akinbode, & Otekunrin; 2020).

The Nigerian government has developed many policies and initiatives targeted at advancing sustainable development and enhancing food security in order to solve these issues. Nigeria has made investments in renewable energy sources as one method of promoting sustainable development. By lowering greenhouse gas emissions and offering a cleaner and more ecologically friendly source of energy, renewable energy can support sustainable development (Lyeonov, Pimonenko, Bilan, Štreimikienė, & Mentel 2019). By making rural areas less susceptible to changes in energy prices, enhancing availability to water for irrigation, and lowering the carbon footprint of the agricultural sector, this transition toward renewable energy can also improve food security (Schwerhoff & Sy, 2017).

However, it is still unclear how well Nigeria's policies and programs for fostering sustainable development and enhancing food security are working when proxied by adjusted net savings. A metric of sustainable development known as adjusted net savings takes into account the rate of genuine or true saving in an economy after taking human capital investments, pollution damages, and resource depletion into account. It is a metric that evaluates a region's economic viability, particularly in light of the government's investment policy.

Despite the significant role of adjusted net savings as a gauge of sustainable development, little is known about the relationship between Nigerians' use of renewable energy and adjusted net savings. Despite the fact that there have been several research on the development of renewable energy use in Nigeria, few have looked at how these patterns affect adjusted net savings. By examining the relationship between renewable energy consumption and adjusted net savings in Nigeria with an emphasis on their influence on food security, this study seeks to fill this gap in the literature.

The study will analyze the central, correlation, and dispersion behavior of renewable energy consumption and adjusted net savings in Nigeria. This will be achieved using data from the World Bank and other appropriate sources. The results of this study will provide light on Nigeria's policies and initiatives that try to advance sustainable development and enhance food security, with potential repercussions for other developing nations dealing with comparable issues. Given the crucial roles that sustainable development and food security play in achieving total growth and development in the economy of Nigeria, the relevance of this study cannot be emphasized. By 2040, Nigeria is anticipated to contribute almost 69% of all energy consumed in Africa, according to world projections (International Energy Agency, 2021). Therefore, the findings of this study will be instrumental in guiding policymakers in the development of strategies aimed at promoting sustainable development and improving food security in Nigeria.

In conclusion, the purpose of this study is to examine the relationship between the use of renewable energy sources and adjusted net savings in Nigeria, with a particular emphasis on how these savings affect food security. The results of this study will provide light on how well Nigeria's policies and programs for fostering sustainable development and enhancing food security are working. The study will evaluate the central, correlation, and dispersion characteristics of renewable energy consumption and adjusted net savings in Nigeria using data from the World Bank and other pertinent sources as well as adjusted net savings as a proxy for sustainable development. The study is important because it will aid in the understanding of the relationship between the consumption of renewable energy, adjusted net savings, and food security in Nigeria, which can help informing the development of more effective initiatives and strategies aimed at promoting sustainable development and enhancing food security in the nation.

## 2. Literature Review

This literature review examines studies that have investigated the relationship between renewable energy consumption and adjusted net savings in different regions of the world, with a focus on Africa and Nigeria. The review aims to provide insights into the impact of renewable energy consumption on adjusted net

savings, and by extension, sustainable development, and food security. The review is organized into three sections: studies on renewable energy consumption and adjusted net savings, studies on renewable energy consumption and food security, then studies on food security and adjusted net savings.

### **Renewable Energy Consumption and Adjusted Net Savings**

Consumption of renewable energy has been demonstrated to significantly and favorably affect adjusted net savings in many parts of the world. For instance, Hosen, Siddik, Alam, Miah, and Kabiraj (2022) used data from 1990 to 2016 to conduct a study on the connection between renewable energy consumption and adjusted net savings in the Asia-Pacific area. According to the report, greater use of renewable energy can promote sustainable growth in the Asia-Pacific area. Similar to this, Kamoun, Abdelkafi, and Ghorbel (2019) used data from 1990 to 2013 to examine the connection between the use of renewable energy and adjusted net savings in the OECD countries. According to the study, consuming more renewable energy can aid in the OECD countries' transition to sustainable development. Lekwa (2020) investigated the Middle East and North Africa (MENA) region's consumption of renewable energy in connection to adjusted net savings in a different study. The study, which examined data from 2000 to 2017, discovered that the usage of renewable energy had a favorable and significant influence on adjusted net savings, indicating that expanding the use of renewable energy can aid in the region's transition to a more sustainable future. Aldulaimi & Abdeldayem (2022) employed qualitative data from 663 respondents in a related study that was also conducted in the MENA region. The findings revealed a strong correlation between the communities in the MENA and renewable energy technologies.

A study by Wei and Huang (2022) used data from 1990 to 2020 to examine the effects of renewable energy consumption, sustainable development, and adjusted net savings in the Asian economy. The results showed that across Asia, the combined effects of renewable energy, economic expansion, and financial development increase adjusted net savings while lowering non-renewable energy consumption. Similar to this, He and Wei's study from 2023 used data from 2005 to 2020 to analyze how the usage of renewable energy affected adjusted net savings in China's sustainable development. According to the study, using more renewable energy has a favorable and beneficial influence on adjusted net savings, indicating that doing so could help China achieve sustainable growth.

For ten countries in Central and Eastern Europe and the Baltics, data from 2005 to 2016 were used in a study by Larissa, Maran, Ioan, Anca, Mircea-Iosif, Horia, and Dan (2020) to examine the contribution of adjusted net savings to sustainable economic growth. The study discovered a strong and positive association between the use of renewable energy and adjusted net savings, showing that expanding the use of renewable energy can boost the GDP and, consequently, sustainable development in Europe. Similar to this, a study by Khalatur (2022) used data from 2000 to 2020 from European countries to analyze the relationship between green financing and innovation management using the primary indicators of energy production and usage, adjusted savings, among others.

A study by Aboul-Atta and Rashed (2021) used data from 137 nations to examine the effect of renewable energy usage on adjusted net savings in Latin America. The study discovered a strong and positive association between the use of renewable energy and adjusted net savings, indicating that boosting the use of renewable energy can aid in the region's sustainable development. Similar to this, a study by Kamoun, Abdelkafi, and Ghorbel (2020) used data from 1990 to 2012 to investigate the connection between renewable energy use and adjusted net savings in developing nations. According to the study, using more renewable energy has a positive and significant influence on adjusted net savings, which suggests that doing so can help emerging nations achieve sustainable development.

A study by Islam, Ali, Ceh, Singh, Khan, and Dagar (2022) used data from 1980 to 2018 to assess the effects of renewable energy consumption on economic development and adjusted net savings in ASEAN nations. The results of the study indicate that using more renewable energy can support sustainable development in ASEAN nations by having a considerable positive impact on adjusted net savings. Similar to this, a study by

Pardi, Md. Salleh, and Nawil (2015) used data from 20 different economies to examine adjusted net savings as an indication of assessing sustainable development in Malaysia. The study discovered that adjusted net savings, when seen from the perspective of saving as a capital investment and wealth building in Malaysia, is a complete indicator for gauging sustainable development.

Africa is a continent with a high percentage of energy poverty and is particularly sensitive to climate change. Consuming renewable energy has the potential to address both of these issues while promoting sustainable growth. Tsaurai (2020) looked into the connection between BRICS countries' use of renewable energy and adjusted net savings. The analysis of data from 2000 to 2017 revealed that the use of renewable energy significantly and favorably impacted adjusted net savings. The results imply that expanding the use of renewable energy can aid in the sustainable development of Africa. Similar to this, a study by Awodumi and Adewuyi (2022) looked at the connection between Sub-Saharan Africa's use of renewable energy and adjusted net savings. The analysis of data from 1980 to 2015 revealed that the use of renewable energy significantly and favorably impacted adjusted net savings. The results imply that expanding the use of renewable energy can aid in the sustainable development of major African oil producers.

Africa's most populous nation, Nigeria, offers a considerable potential for renewable energy. In comparison to other parts of the world, Nigeria's usage of renewable energy is very low, though it has been rising recently. In Nigeria, the Fakher, Ahmed, Acheampong, and Nathaniel (2023) study looked at the connection between the use of renewable energy and adjusted net savings. The analysis of data from 1994 to 2019 revealed that the consumption of renewable energy had a favorable and significant effect on adjusted net savings. The results imply that boosting Nigeria's use of renewable energy can help the country develop sustainably. Similar research was conducted by Moustapha and Danqauh (2021), who looked at the connection between West African economic growth and the use of renewable energy. Using data from 2000 to 2018, the study discovered that the adoption of renewable energy had a favorable and significant influence on adjusted net savings and economic growth. According to the research, encouraging renewable energy in agriculture can aid in Nigeria and other countries in West Africa's food security and sustainable development.

### **Renewable Energy Consumption and Food Security**

In many parts of the world, consumption of renewable energy has been found to improve food security. For instance, consumption of renewable energy has been demonstrated to support food security in the Asia-Pacific area. A study by Taniguchi, Masuhara, and Danqauh (2021) looked into the connection between Vietnam's food security and the use of renewable energy. According to the study, using renewable energy increased crop yields and decreased food waste, both of which had a beneficial effect on food security. Similar to this, a study conducted in 10 ASEAN nations by Chopra, Magazzino, Shah, Sharma, Rao, and Shahzad (2022) looked at the effect of using renewable energy on food security.

Consuming renewable energy has been found to support food security in Europe. In 2020, Máté, Rabbi, Novotny, and Kovács conducted a study to examine how the use of renewable energy affects food security in Central Europe. The study discovered that using renewable energy increased agricultural output and decreased greenhouse gas emissions, which had a favorable effect on food security. Similar to this, Bajan, Ukasiewicz, and Mrówczyńska-Kamiska's study from 2021 looked at the connection between the use of renewable energy sources and food security in the European Union. According to the study, using renewable energy decreased the negative environmental effects of agricultural production and increased food availability, which had a beneficial effect on food security.

Consuming renewable energy has been found to support food security in Latin America. In Colombia, the relationship between the use of renewable energy and food security was examined by Granit (2022). According to the study, using renewable energy reduced the cost of agricultural production and increased access to electricity for irrigation, both of which had a beneficial effect on food security. Similar to this, a 2020 study by Sánchez-Zarco, Mora-Jacobo, González-Bravo, Mahlknecht, and Ponce-Ortega looked at the effect of using renewable energy on food security in Mexico. According to the study, using renewable energy decreased

the cost of energy for agricultural output and increased crop productivity, both of which had a beneficial effect on food security.

It has been discovered that using renewable energy also helps to ensure food security in sub-Saharan Africa. Between 2001 and 2015, a Kinda study (2021) examined the connection between the use of renewable energy and food security in 35 Sub-Saharan African nations. According to the study, using renewable energy increased access to green energy, which improved food security. Similar to this, a research by Tofu, Wolka and Woldeamanuel (2022) looked at the effect of Ethiopia's use of renewable energy on food security. According to the study, using renewable energy increased the amount of energy available for irrigation and decreased the cost of agricultural production, both of which had a beneficial effect on food security.

Food security in Nigeria has been linked to the use of renewable energy. Consuming renewable energy has been mentioned as a potential solution to Nigeria's energy problems, and there is data to support the notion that it can also help with food security. According to a study by Ajayi, Mokryiani, and Edun (2022), renewable energy can improve food security and agricultural output in Nigeria by supplying dependable and inexpensive electricity to lessen the consequences of climate change. This is crucial in a nation where the vast bulk of agricultural activities are dependent on rain and susceptible to droughts. Similar to this, Onah, Okafor, Oyigbo, and Nnate's study from 2021 discovered that renewable energy can help Nigerians have more access to food by lowering the cost of agricultural production. The study underlines the potential of renewable energy sources such as solar energy to power agricultural equipment such as water pumps and milling machines, which can minimize the reliance on expensive fossil fuels.

Another study by Akintola and Fakoya (2017) looked at the situation of small-scale fishing in Nigeria to analyze the effect of renewable energy on food security. The study demonstrated that by lowering post-harvest losses, the utilization of renewable energy sources like solar and biogas greatly increased food security. The potential of renewable energy to support sustainable agriculture in Nigeria by lowering greenhouse gas emissions from agricultural operations is also highlighted in a research by Okorie and Lin (2022). The findings indicate that Nigeria's total agricultural level of emission is mostly driven by the intensity of agricultural greenhouse emission and per capita output.

Additionally, a study by Edoja, Aye, and Abu (2019) emphasizes the value of renewable energy in tackling Nigeria's urban food security challenges. According to the study, fresh produce is more readily available in urban marketplaces and food waste can be decreased with the help of renewable energy technology like solar-powered refrigerators and cool rooms. A study by Nwaokocha, Alamu, Giwa, Layeni, Kuye, and Oyedepo (2018) also emphasizes the potential of renewable energy in enhancing the nutritional quality of food in Nigeria by enabling the manufacture of fortified foods. The study suggests using renewable energy sources to produce fortified foods, which can aid in reducing malnutrition in Nigeria. Examples of these sources include solar and biomass.

### **Food Security and Adjusted Net Savings**

The importance of food security and adjusted net savings has increased in the discussion of global development. A measurement of sustainable economic growth that takes into account the depletion of natural resources and the degradation of the environment is called adjusted net savings. This review will examine the relationship between adjusted net savings and food security, starting with all continents barring Africa and focusing on Nigeria.

Research from several parts of the world has demonstrated a connection between adjusted net savings and food security. For instance, a study conducted in Latin America by Hunjra, Azam, Bruna, and Bouri (2023) discovered that the results of food security are generally better in countries with greater adjusted net savings. According to the study, food security and sustainable development have a beneficial link. According to a study conducted in the Asia-Pacific region by Hosen, Siddik, Alam, Miah, and Kabiraj (2022), nations with higher adjusted net savings tend to have higher agricultural output and better food security results. The study emphasized the value of making investments in sustainable economic growth to guarantee long-term food



security. According to a study by Katan, Dobrovolska, and Espejo (2018), across Europe, adjusted net savings are positively connected with food security, showing that the region's food security depends on sustainable economic growth. The study emphasized how public policies, such as those governing agriculture and the environment, might help to advance both food security and sustainable economic growth.

In poor nations, such as those in Africa, according to a study by Pawlak and Koodziejczak (2020), adjusted net savings are positively correlated with food security. According to the report, this is because sustainable economic development has a favorable effect on agricultural output, income, and food access. Similar to this, a 2017 study in sub-Saharan Africa by Twerefou, Danso-Mensah, and Bokpin discovered that adjusted net savings are positively associated with food security, emphasizing the significance of sustainable economic development in reducing food insecurity in the area. Other African studies have also looked into the relationship between food security and adjusted net savings. A study by Borowski and Patuk (2021) examined the relationship between food security and adjusted net savings in five African and European countries and found that adjusted net savings had a significant positive impact on food security, indicating that investments in natural capital can help improve food security in Africa.

From the literature, to the best of knowledge, there are no studies in the Nigerian region that have considered the nexus among renewable energy consumption, food security and sustainable development using adjusted net savings as the measure of sustainable development. In consideration of this, the study will be running background checks on the variables to observe and report their behavior using descriptive statistics. These background checks will enable the extraction of inferences that can be subjected to further analyses.

### 3. Methodology

The variables considered in this study are renewable energy consumption, food security and sustainable development for Nigeria between 1990 and 2019. Food security is proxied by cereal yield in kilogram per hectare, while sustainable development is proxied by adjusted net savings. In this section, the trend analysis for each variable, as well as their summary statistics and a correlation matrix are presented and explained.

The chart 1 below shows the trend of renewable energy consumption, adjusted net savings and cereal yield in Nigeria between 1990 and 2019. There is a very slight decrease in the consumption of renewable energy throughout this period. The country's use of renewable energy peaked twice, in 1994 and 2009, and was at its lowest point in 2014. The second-lowest point of renewable energy consumption was in 2019.

Still from chart 1 below, the adjusted net savings similarly show a general downward trend, but with steeper slopes than the period's renewable energy consumption. There was a steep decline in the variable until it reached a low in 1993, following which there were only a few tiny spikes and falls until 1998, when there was a dramatic spike that persisted for two years. Nigeria had its highest adjusted net savings in 1991. Between 2005 and 2007, there was another significant upswing and downswing, and since then there has been a persistent downturn. Adjusted net savings appeared to be increasing from 2018.

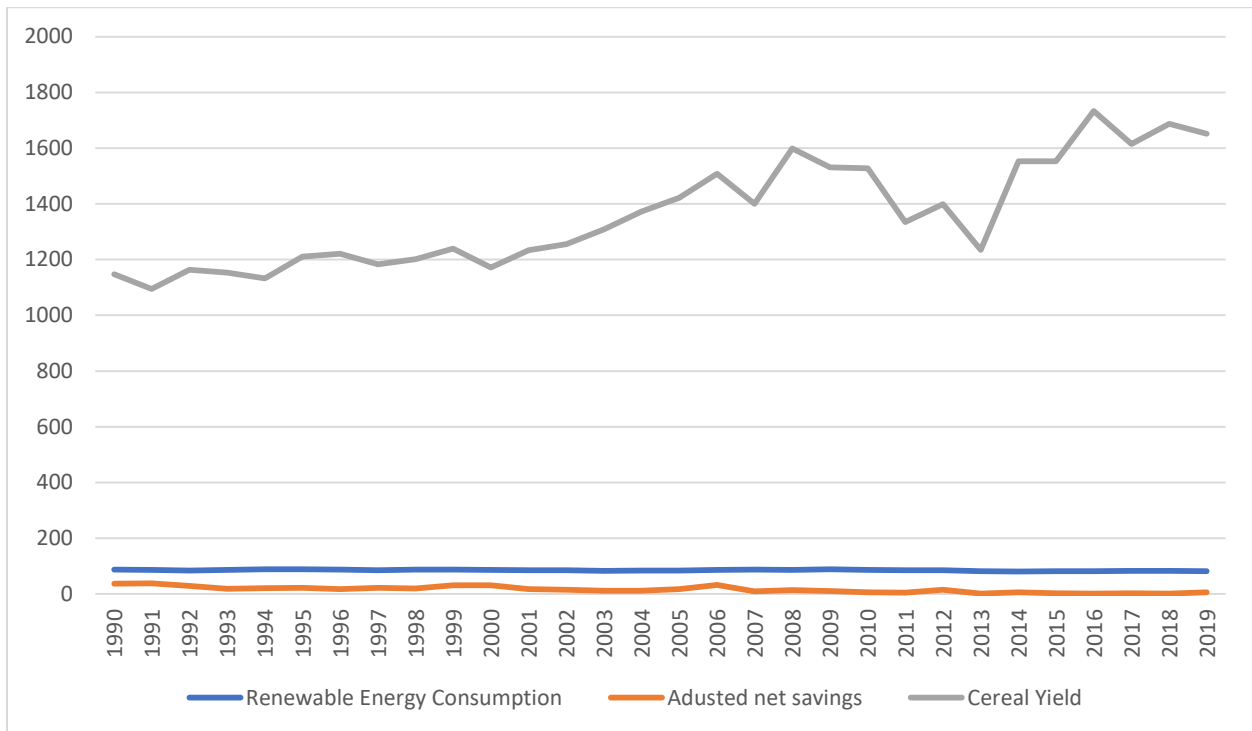
The final variable of consideration in this trend analysis is cereal yield. The variable was at its lowest point in 1991, after which it started to increase at a decreasing rate up until a sharp increase between 2000 and 2005. A decline occurred by 2006, which was offset by a rise in 2007. A sharper decline than the previous 12 years occurred between 2007 and 2013, after which a moderately sharp increase followed from 2013 till 2016. The cereal yield between 2016 and 2019 appears to be treading the path of a decline.

It is interesting to note that while renewable energy consumption seems to show an opposing behavior to that of adjusted net savings, its behavior seems to align with that of cereal yield in the Nigerian case. This observation is enough to hypothesize that renewable energy consumption shares a negative relationship with adjusted net savings, while it seems to share a positive relationship with cereal yield. This seems to negate consensus in literature that states that the production stage in crop production makes more use of non-renewable energy such as diesel for tractors, generators and other farming implements for mechanized farming. Mechanized farming is responsible for less than 20% of total crop production in Nigeria. Subsistence agriculture is the predominant agricultural practice, and it utilizes manual methods and human labor in place

of machines. Therefore, this anomaly that opposes the trend analysis in this study needs to be investigated further.

Table 1 below presents the correlation matrix for renewable energy consumption, cereal yield and adjusted net savings in Nigeria. 0.6159 depicts a moderately strong correlation between renewable energy consumption and adjusted net savings. Even though Figure 1 claims that there may be a negative relationship between renewable energy consumption and adjusted net savings, the correlation between them is above average. This tilts towards the fact that correlation is not necessarily causation. Furthermore, a correlation value of 0.62 means that if both renewable energy consumption and adjusted net savings are considered as independent variables in a study, there may be weak multicollinearity between them. This could make them a good fit to be considered in a multiple regression analysis to explain a phenomenon in Nigeria.

Still from Table 1, it is interesting to see a negative correlation between renewable energy consumption and cereal yield. This is shown in the figure -0.5484. This correlation figure seems to agree with the consensus from literature that renewable energy consumption in Nigeria has a negative relationship with food security. However, this negates the claim from the trend analysis in Chart 1. As correlation does not imply causation, it is necessary to investigate whether causation exists between these variables in the Nigerian case.



**Figure 1: Trend Analysis of Renewable Energy Consumption, Cereal Yield and Adjusted Net Savings in Nigeria**

Source: Authors' compilation

We also see observe a negative correlation between adjusted net savings and cereal yield. This aligns with the position of the trend analysis in Chart 1 which shows a negative relationship between adjusted net savings and cereal yield. There could be a negative relationship between cereal yield and adjusted net savings due to several reasons. Firstly, cereal yield is an indicator of agricultural productivity, and higher cereal yields imply more significant production and more income for farmers. This could result in higher savings, leading to increased adjusted net savings. Conversely, lower cereal yields could lead to lower agricultural productivity, leading to lower incomes and savings. Secondly, agricultural productivity and adjusted net savings are both

influenced by several factors, such as infrastructure, investment in education, healthcare, and technology. If investment in infrastructure, education, or technology is lacking, it could negatively affect cereal yields and savings. Lastly, climate change could also play a role in this relationship. Climate change can impact cereal yields negatively, leading to lower agricultural productivity, and lower adjusted net savings. Additionally, efforts to mitigate climate change could require significant investments, reducing savings.

**Table 1: Correlation Matrix**

	REC	ANS	CY
REC	1		
ANS	0.615901754	1	
CY	-0.548369309	-0.693411862	1

Source: Author's Computation

The summary statistics for this study are displayed in Table 2 below. Summary statistics are poised to give handy information about the measures of dispersion and central tendency of different variables. They are very useful for observing the behavior of data, as well as for formulating testable hypotheses. The mean value of renewable energy consumption between 1990 and 2019 is 85.06. Its standard deviation is 2.27, the minimum is 80.04 while the maximum value is 88.68. This means that the average value of how much renewable energy has been consumed in Nigeria in 30 years has experienced very little changes over time. This could be explained by high fossil fuel consumption, easier access to fossil fuel energy and high cost of renewable energy technologies (International Energy Association, 2020).

The average of adjusted net savings is 15.84. The minimum and maximum values are 1.16 and 38.31, respectively, with a standard deviation of 10.94. This implies that adjusted net savings have varied widely during the time, and Figure 1's erratic trend illustrates this point. The depletion rates of solid minerals and energy seem to be the main drivers of the large difference in net adjusted savings. This corroborates the high dependence on fossil fuel energy consumption in Nigeria, which is in alignment with the conclusion from the summary statistics for renewable energy consumption.

Finally, for cereal yield, the mean value over the 30-year period is 1361.18. The minimum and maximum values are 1094.10 and 1733.40 respectively. The standard deviation for cereal yield is 190.92. This shows that there has been a wide variation in the cereal yield values over the period. This can possibly be explained by the effects of climate change as well as low domestic production of wheat to match local demand.

**Table 2: Summary Statistics**

		REC		ANS		CY	
Mean	2004.5	Mean	85.06475	Mean	15.83691	Mean	1361.176
Standard Error	1.60727 5127	Standard Error	0.416086 467	Standard Error	1.999107 408	Standard Error	34.85791 148
Median	2004.5	Median	85.11064 459	Median	14.98864 008	Median	1321.6
Mode	#N/A	Mode	#N/A	Mode	#N/A	Mode	#N/A
Standard Deviation	8.80340 8431	Standard Deviation	2.278999 436	Standard Deviation	10.94956 222	Standard Deviation	190.9246 442
Sample Variance	77.5	Sample Variance	5.193838 428	Sample Variance	119.8929 129	Sample Variance	36452.21 978
Kurtosis	-1.2	Kurtosis	- 1.006751	Kurtosis	- 0.702459	Kurtosis	- 1.173649



			096		837		158
Skewness	6.56289 E-17	Skewness	- 0.252541 031	Skewness	0.465597 057	Skewness	0.425468 333
Range	29	Range	8.04	Range	37.15187 767	Range	639.3
Minimum	1990	Minimum	80.64	Minimum	1.163061 169	Minimum	1094.1
Maximum	2019	Maximum	88.68	Maximum	38.31493 884	Maximum	1733.4
Sum	60135	Sum	2551.942 6	Sum	475.1074 234	Sum	40835.3
Count	30	Count	30	Count	30	Count	30
Largest(2)	2018	Largest(2)	88.61137 244	Largest(2)	36.51871 865	Largest(2)	1687.7
Smallest(2)	1991	Smallest(2)	81.4	Smallest(2)	1.738963 53	Smallest(2)	1132.3

Source: Author's Computation

#### 4. Conclusion

This preliminary study has showcased an introduction and a literature review. It has also analyzed and interpreted the summary statistics. From what was found, there is the possibility of Nigeria being an exception to the trend in literature that states that there is a positive and significant relationship between renewable energy consumption and sustainable development proxied by adjusted net savings. There is also the possibility of an exception to the apriori expectation that renewable energy consumption should have a positive relationship with food security proxied by cereal yield. There is the need for further research to test the cause-effect relationship among the variables empirically to verify these hypotheses.

This study contributes to literature as a reference point for further research on the nexus between renewable energy consumption, food security and adjusted net savings in Nigeria. It is novel in this regard. There is also the need for further studies to examine the relationship between non-renewable energy consumption, food security and adjusted net savings in Nigeria. Nigerian food security and energy literature lacks the consideration of interaction with adjusted net savings as a measure of sustainable development.

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