Research Article

Foreign Aids and Sustainable Development in Nigeria: An Application of Dynamic Least Squares Approach

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Abstract. The impact of foreign aid in donor and recipient countries is largely unsettled amongst existing studies, as well as, literature. This is attributed to the various arguments for and against the benefits of foreign aid, as it relates to sustainable development. As such, the study examined the effect of foreign aids on sustainable development in Nigeria from 1986-2021. The study used Augmented Dickey Fuller (ADF) unit root test, Johansen Co-integration test, Dynamic Least Squares (DOLS) and Granger Causality test. The ADF result showed that sustainable development, foreign aids, exchange rate, inflation rate and trade openness were stationary at first level difference. Also Johansen co-integration test confirmed a long-run relationship between the variables. The DOLS result revealed that, foreign aid, exchange rate and trade openness were significant with each exhibiting a direct link with sustainable development at 5%; while, that of foreign aid was at 10%. This suggests that inflow of foreign aids in different forms is essential for resource conservation. Also, inflation rate showed an inverse and significant link with sustainable development at 5%. In addition, a bi-directional causality was established between foreign aid and sustainable development. The study concluded that foreign aids in different forms, exchange rates stability and high exportation that comply with environmental

sustainability boost Nigeria's sustainable development growth, but spiral inflation worsens it. Thus, it is advised that government should declare an emergency over environmental issues in order to guarantee an increase in the flow of foreign aid into environmental sustainability.

Keywords: Foreign aids, sustainable development, exchange rate, Dynamic Least Squares (DOLS),

INTRODUCTION

Many developing countries, Nigeria inclusive, are even more susceptible to the negative effects of climate change because of environmental deterioration. In light of this, Perveen and Khan (2021) reveal that developing countries, as opposed to developed ones, are much more vulnerable to climate change damages due to their low adaptation capacity and their disproportionate dependency on natural resources for welfare. As such, many of them have depleted their respective environmental formations due to harnessing natural wealth (Falade, 2021). In the modern world, environmental degradation has emerged as one of humanity's greatest challenges.

However, to support developing countries' efforts toward a sustainable future, they require financial assistance from wealthier nations. Foreign aid has been a significant global effort on the part of wealthier nations to increase the prosperity of underdeveloped nations. For example, some scholars agree that the primary factors influencing foreign direct investment (FDI) in sub-Saharan Africa (SSA) are natural resources and market size. The data, which indicates that in 2021 South Africa, Nigeria, and Rwanda were the top three receivers of foreign aid in Africa, seem to corroborate this notion (International Monetary Funds, 2022).

Foreign aid is one of the most crucial tactics for attaining sustainable development when rightly used (Asongu, & Nnanna, 2018). Foreign aid otherwise known as foreign assistance, is a freely offered transfer of resources from one nation to another, provided at least in part with the intention of helping the receiving nation (Simbarashe, 2012). Hence, non-repayable grants, soft loans with stringent terms, project and non-project assistance, technical support, relief aid packages (for natural disasters), foreign direct investment, credit for BOP imbalance, etc. are typically good example of it. Given this, international organizations like the International Monetary Fund, World Bank, Agriculture Organization, advanced economies and others are often considered as donors of such aid.

Nowadays, attaining the much-desired sustainable development has emerged as one of the top concerns for any country, especially with the adopted of global goals with a time target of 2030. Foreign aid, however, has a favorable effect on growth and sustainable development, as several studies have demonstrated (Abeselom, 2018; Asongu & Nnanna, 2018). Perveen and Ali (2021) assert that foreign aid would promote sustainable development and economic growth via creating jobs, bridging the savings gap, satisfying the huge demand for investments, and leveraging it to bring about a green revolution. In contrast, Nelson, Richardson, and Winnie (2019) argue that foreign aid is not only inefficient but also detrimental since it is not directed toward the intended goals.

Also, along with more unfavorable climatic shifts and natural calamities, human progress over the past few decades have also resulted in wars, political unrest, and socioeconomic instability. A good example of it is Russo and Ukrainian War, Israel-Hamas War, and others. As such, human activity has had a detrimental effect on the ecosystem, putting the planet's existence and that of future generations in jeopardy (Tomislav, 2018). Unfavourable climatic changes have drawn more attention to the idea of sustainable development on a global scale. The notion of sustainable development stems from three key concepts: development (i.e., socio-economic growth within ecological limitations), needs (i.e., resource redistribution to guarantee a high standard of living for all), and future generations (i.e., the potential for long-term resource use to guarantee a minimum standard of living for future generations) (European Sustainable Development Network ESDN, 2013).

The need for sustainable development was also sparked by the announcement of the Sustainable Development Goals (SDGs) on September 25, 2015.   This SDGs is a right call in the right time due many environmental degradation witnessing in many part of the world, especially in African nations. For instance, over 90% of the environmental and social damage in some parts of Nigeria has been attributed to oil spills (Oshienemen et al., 2017). Aside this, the bulk of the nation is plagued by environmental problems; therefore, this scenario is not exclusive to the Niger Delta and onshore areas. Asongu and Nwachukwu (2017) demonstrate that foreign aid not only gives sub-Saharan African nations the much-needed capital for investment, but also improves the creation of jobs, the acquisition of managerial skills, the provision of socio-amenities, and the transfer of modern technologies, all of which over time support long-term economic growth, development and sustainable development.

Statement of the Problem

Today, a number of nations take part in the international assistance process as donors, receivers, or as both donors and recipients. Due to the numerous arguments for and against the advantages of foreign aid, the impact of aid on donor and recipient nations remains largely unresolved in theory and empirical stands (Asongu & Nnanna, 2018). Aside this, foreign assistance offers additional financial resources that help improve a country's political and economic environments, in addition to complementing and supplementing domestic resources, many policy makers feel that foreign aid equates to economic growth (Perveen & Ali, 2021). Conversely, some contend that foreign aid has the potential to supplant domestic savings and foster reliance on aid, so impeding the expansion of the economy and investment (Manwa & Wijeweera, 2016; Malefane, & Odhiambo, 2018). According to these stand, foreign aid encourages aid reliance while providing political elites in recipient nations with a secondary source of income. These elites are motivated to maintain their domination over the political and economic landscape in order to keep their secondary source of revenue for longer time. This is especially true in Africa, where foreign aid has been utilized to advance the agendas of powerful elites rather than to build economies, advance democratic government, better citizens' life and uphold the rule of law (Gibson et al., 2014).Thus, foreign aid is seen to promote corrupt, extremely inefficient, and ineffective governments in Africa, impede economic and investment

growth, stall democracy and the upholding of the rule of law, and promote unstable economic policies (Abeselom, 2018; Nelson et al., 2019).

The International Monetary Fund designated Nigeria in 2022 as one of the African countries that receives the highest amount of foreign aid, despite its weak progress in sustainable development. This makes it necessary for the current study to look at the relationship between Nigeria's circumstances and the trend of foreign aid and sustainable development. Additionally, Igor et al. (2022), Saleem et al. (2022), Perveen and Ali (2021) and Asongu and Nnanna's (2018) affirmed that a direct and significant link did occur between foreign aid and sustainable development; while, Mohammed et al. (2018) and Abeselom (2018) did confirm the direct link but non-significant connection; with a conclusion that disregarded the idea that foreign aid might either cause or contribute to sustainable development. Nonetheless, this is required as the Sustainable Development Goals (SDGs) Program aims to educate people and governments about the value of maintaining the formation of natural systems. Therefore, the study appraised whether foreign aid contributes to sustainable development growth or the other way around.

LITERATURE REVIEW
Sustainable Development

Resource conservation for future generations is the process of sustainable development. Long-term economic and environmental stability is the main objective of sustainable development (SD), and it can only be attained by integrating and acknowledging social, environmental, and economic considerations at every stage of the decision-making process (Perveen & Ali, 2021). One problem with using this idea of sustainable development is capital substitutability. Capital comes in three forms: natural, social, and man-made (Stoddart, 2011). According to the notion of weak sustainable development, capital levels alone are important, and manufactured capital can serve as a sufficient substitute for natural capital. Conversely, strong sustainability acknowledges the special qualities of natural resources that are unreplaceable by artificial capital. The robust sustainability concept is supported by the majority of ecologists and environmentalists (Stoddart, 2011).

Furthermore, this notion of sustainability is based on a number of other significant ideas. Intergenerational equity, as defined by Stoddart (2011), acknowledges the long-term scope of sustainability in order to meet the demands of future generations. This is encompassed under the mainstream concept of sustainable development. In accordance with the polluter pays concept, governments should mandate that polluting entities pay for their pollution rather than placing the burden on others or the environment (Simbarashe, 2012). In order to reduce externalities, government policy should thus make sure that environmental costs are internalized whenever feasible. Nonetheless, the precautionary principle states that "lack of complete scientific certainty shall not be used as a reason for postponing cost-effective measure to prevent environmental degradation where there are threats of serious or irreversible damage" (United Nations Conference on the Human Environment, 2022). As a result, it is the responsibility of the activity's proponent to demonstrate that it won't have a substantial negative impact. The idea of common

but differentiated duties is explicitly mentioned in the Rio Declaration and acknowledges that every country has a role to play in the problem of sustainable development. The figure below depicts Nigeria trend of Sustainable Development as proxied with adjusted net savings (% of GNI)

Figure 1. Trend Analysis of Sustainable Development
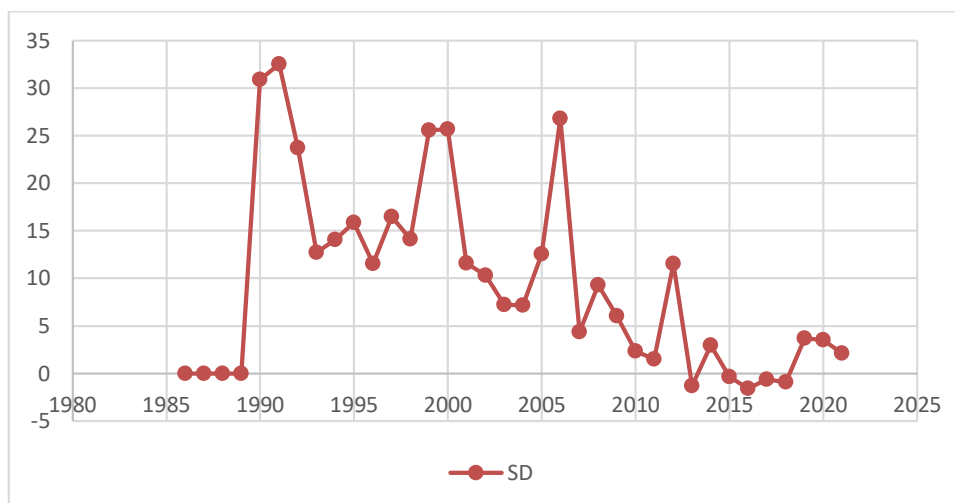
Source: Excel Output through World Bank Development Indicator Data (2023)

The sustainable development of Nigeria's from 1986 to 2021 is depicted in Figure 1. According to the graph above, in 1986, there was a lower degree of sustainable development in terms of preserving resources for future generations than there had been when official development assistance was received. Nonetheless, Nigeria's degree of sustainable development improved starting in 1989, with a score of 32.54%, the maximum degree of sustainable development was achieved in 1991. The rationale for such high value may be attributed to government policy especially the introduction of War Against Indiscipline (WAI). However, it remained unstable from 1992-2000. The rationale could be due to political instability. Also, it has remained unstable from with declining in value from that 2001-2021.

EMPIRICAL STUDIES
Empirical Review from Developed Countries

Igor et al. (2022) used a literature base approach research technique to examine innovative funding in relation to the sustainable development goals in Western Balkan nations. It was found that 82.4% of the analyzed papers supported the idea that public finance for external assists encourages sustainable development. The study came to the conclusion that investigating more creative ways to fund sustainable societies would be advantageous for the associated nations. Using a panel of 34 countries divided into three groups based on the level of economic integration, Durkalić and Ćurčić (2019) compared the debt sustainability of EU candidates and EU members using the Promethee-Gaia approach. They also investigated whether the fiscal indicators of EU candidates were worse than those of EU members. The research

topic is a comparative analysis displaying the ranking of nations in the three observable groups: EU candidate countries, European Monetary Union candidate countries, and European Monetary Union member countries. The panel pool data revealed that while foreign aid received by European Monetary Union member nations was non-significant, it was considerable and closely associated to sustainable development in EU candidate countries and European Monetary Union candidate countries. Using the Bootstrap ARDL test, Saleem et al. (2022) produced new data by examining the relationship between Turkey's foreign debt, financial development, and use of renewable energy. The results of the ARDL test show that renewable consumption and Turkey's financial development are positively correlated; moreover, the results show that the coefficient of external debt is negative and substantial. These three reviewed studies were conducted outside Nigeria's domain; hence, their respective findings may not truly reflect Nigeria's situation due to difference in environmental formation.

Empirical Review from Developing Countries

Asongu and Nwachukwu (2016) used the GMM approach to examine the impact of a variety of foreign aid patterns on inequality-adjusted human development using sample of 53 African nations for the years 2005–2012. The results demonstrated the beneficial effects of assistance dynamics at high replacement levels. These include help for the productive sector, social infrastructure, economic infrastructure, and multi-sectors; the impact of humanitarian aid is invariably detrimental across specifications and models. A related research conducted by Yongfu et al. (2017) investigated the potential contribution of foreign aid to sustainable development when combined with other economic, social, and environmental aspects. The empirical component of the chapter shows evidence that foreign aid has had a considerable beneficial impact on sustainable development in aid recipient nations. Mohammed et al. (2018) used time series data covering the years 1980–2015 to examine the link between foreign aid and economic development in Sudan. The study used autoregressive distrusted lag (ARDL) approach. The findings showed that while foreign aid had a short-term favorable influence on Sudan's economic growth, it had a long-term detrimental impact due to public institution corruption. In summary, the study found that if foreign aid is directed on developing Sudan's human capital, it may contribute to sustained prosperity. The studies reviewed were conducted in some years past; hence, do not reflect present situations.

Abeselom (2018) appraised the relationship between Ethiopia's sustainable growth and foreign aid. The study used panel pool data together with yearly data covering the years 1980–2015. According to the estimation result, government development aid and foreign debt have a statistically significant detrimental impact on Africa's ability to experience sustainable growth; while, the impact of foreign direct investment on sustainable growth was beneficial. According to the estimation result, the only variable that has a statistically significant and beneficial impact on Ethiopia's sustained growth is technical cooperation funds. Asongu and Nnanna's (2018) examined whether development assistance can support inclusive human development. The Generalized Method of Moments and data from 53 African nations

covering the years 2005–2012 was used. According to the findings, foreign aid has a short-term positive impact on inclusive human development but a long-term negative impact. Adams and Elassal (2020) used data from 1980 to 2015 to investigate whether assistance flows had influenced economic development or growth divergence across a sample of Asian and African nations. The results strongly showed that there is no relationship at all between assistance flows and growth divergence or long-run development pathways in both the Asian and African populations. These studies were carried out in other developing nations, without a similar trend in macroeconomic indices with that of Nigeria; hence, brings need for other study, that relates to Nigeria.

Perveen and Ali (2021) studied how Pakistan's sustainable development was affected by government development aid between 1976 and 2017. Using the Autoregressive Distributed Lag (ARDL) Approach, the long-term connection between the variables under consideration was ascertained. Error Correction Estimation showed a substantial long-term association between ODA and sustainable development. The speed of adjustment term in the ECM regression indicates a negative and significant value, indicating that the model is stable and converging towards equilibrium. The study's overall findings supported the strong and positive correlation between ODA and the indicator of sustainable development in Pakistan. Chen and Wan (2022 investigated the effects of China's foreign help on the economic development of 121 recipient countries between 2000 and 2017, using the OECD Creditor Reporting System (CRS). The results showed that: (i) there is a threshold effect and a "U-shaped" relationship between China's foreign aid and the economic growth of recipient countries; (ii) the relationship between the economic growth of recipient countries and their reliance on China's foreign aid is "inverted U-shaped," involving both growth aid and welfare aid; and (iii) there is observable regional heterogeneity in the economic impact of China's foreign aid, which may be underestimated if the endogeneity problem is ignored; and (iv) China encourages recipient nations to thrive economically through factor mobility, foreign direct investment (FDI), and international commerce through its foreign assistance, particularly growth aid. Rasheed and Andrew (2022) studied economic inequality and foreign on poverty in Africa between 1990 and 2016. It was revealed through empirical validation that the interaction of inequality with money from the United Nations Development Programme (UNDP) and OECD Official Development Assistance is not statistically significant. Also, the statistically significant and anticipated outcomes of the UNDP funding and OECD Official Development Assistance measures reduce poverty on the impoverished continent.

Empirical Review from Nigeria

Using Nigeria as a point of reference, Nelson et al. (2019) examined the relationship between foreign aid and sustainable growth in Africa from 1970 to 2017. External debt (EXD) and official development aid (ODA) have a negative and statistically significant impact on sustainable growth in Africa, according to the quantile regression estimation result; while, the impact of foreign direct investment (FDI) on sustainable growth was substantially significant. Alimi (2018) used a

dynamic panel ARDL model using the Pooled Mean Group (PMG) estimator to evaluate the relationship between poverty and foreign aid for 14 low-income, 7 lower-middle-income, and upper-income nations in sub-Saharan Africa (SSA) from1990–2015. According to the study, public investment and foreign aid have a good effect on poverty levels in lower-middle-class nations but a negative influence on those in upper-class countries. Also, Ubi and Ebi (2021) investigated the relationship between foreign aid and Nigeria's development process from 1980-2018, using a correlation matrix. The findings demonstrated that: (i) the link between assistance and development in Nigeria varies depending on the era or regime examined; and (ii) periods of extremely large inflows of foreign aid appear to encourage improvements in the majority of development indicators. (iii) Compared to other development indicators like economic growth, capital creation, the number of paved roads, etc., the health and education proxy measures, measured by the infant mortality rate and secondary school enrollment, respectively, appear to be more favorably sensitive to changes in foreign assistance intake. The impact of external borrowing and foreign financial aid on the expansion of the Nigerian economy was examined by Ugwuegbe, Okafor, and Akarogbe (2016) using the Ordinary Least Squares approach (OLS). The findings demonstrated that whereas foreign debt has a positive and large impact on economic growth, foreign aid also positively correlates with GDP. This suggests that although it hasn't been felt much, foreign aid is good to Nigeria.

Theoretical Framework and Methodology

The theoretical framework used in this study was associated with the Pigou (1925) theory of environmental externalities. According to the theory, externalities occur when the activities of one economic actor, for example, overseas donors directly impact the actions of another economic agent, recipients of the market system. This circumstance produces a beneficial externality. When foreign donors provide developing nations financial help to enhance their environmental conditions, this is a result of positive externalities. Developed countries must make up for the high prevalence of vulnerability in emerging nations. According to Edwards (2015), the United States of America's initiative to provide economic assistance for rebuilding Europe after World War II began with economic and political goals. This initiative later evolved into a humanitarian cause, as well as, economic and political development goals. On the other hand, other scholars argue that the concept of foreign aid originated from the belief that low-income countries cannot develop economically on their own and would require assistance from rich nations (Asongu, & Nnanna, 2018). In a numerical format, below is a description of the hypothesis;

$$PMC_o = f (C_t, C_{t+1}, C_{t+2}, ... C_{t+n}) ....(i)$$
$$MD_o = f(D_t, D_{t+1}, D_{t+2} ..... D_{t+n}) ....(ii)$$

Where;
$C_t, C_{t+1}, C_{t+2}.....C_{t+n}$ denotes additional unit of production in each year (i.e., year t....n) and $D_t, D_{t+1}, D_{t+2},.....D_{t+n}$ denotes more damage in each year. PMC_o and PMC_o, respectively, stand for Private Marginal Cost and Marginal Damage (MD).

Theoretically, equations i and ii must be valid for all time periods. Remember that the sum of Private Marginal Cost equates Marginal Damage is a necessary and sufficient condition for Social Marginal Cost. The result is what is listed below.

$$SMC = PMC_0 + MD_0 \quad ..... \quad ...... \quad ..... \quad (iii)$$

Equation iv is obtained by substituting equations i and ii into iii

$$SMC = (C_t + C_{t+1}, + C_{t+2}, ... + C_{t+n}) + (D_t, + D_{t+1}, + D_{t+2}..... + D_{t+n}) > 0 \quad .... \quad ... \quad ....(iv)$$

Formally, if SMC > 0 is shows that compensation is paid to the affected economic agent economic agent (receiving countries); when SMC < 0 is shows that no compensation is paid or the lesser compensation is paid.

The model used for the aim of this study was based on the work of Perveen and Ali (2021). Consequently, the following is the fundamental model for Perveen and Ali (2021);

$$SD = f(ODA, GDPPC, INF, TRDO) \quad ..... \quad ..... \quad .....(v)$$

Where;

SD = Sustainable Development (Proxy as Adjusted Net Savings (% of GNI);
ODA = Official Development Assistant (% of GNI);
GDPPC = GDP Per Capita for Pakistan (Current US $).
INF = Inflation (Consumer Prices, Annual %)

To achieve aim of the study, the updated version of the model was provided in a linear model equation;

Model 1

$$SD = f (FAIDS, EXC, INF, TOP) \quad ...... \quad ...... \quad ...... \quad (vi)$$

Where;

SD = Sustainable Development;
FAIDS = Foreign aids;
EXC = Exchange rate;
INF = Inflation rate and
TOP = Trade openness

For two reasons, the model mentioned above was altered. Since theory holds that the economy must be liberated before accepting foreign aid and other forms of international assistance, trade openness was first included. Second, when foreign aid in cash is changed to naira, the exchange rate is taken into account.

The econometric form of equation (vi) becomes

$$SD = \partial_0 + \partial_1 FAIDS + \partial_2 EXC + \partial_3 INF + \partial_4 TOP + \mu_t ....(iii)$$

The related a priori expectations are: $\partial_1 > 0, \partial_2 > 0, 0 > \partial_3 < 0, and 0 > \partial_4 > 0$

Table 1: Measurement of Variables

Variable	Measurement	Source
SD	Stands for sustainable development and acts as a dependent variable in the study. It is measured as adjusted net savings as a percentage of GNI	World Development Indicators (2023)
FAIDS	It is measured as Official Development Assistant as percentage of GDP	World Development Indicators (2023)
EXC	Monthly average official exchange rate of Naira relative to US dollar (₦/$)	CBN Statistical Bulletin 2021
INF	Inflation rate	CBN Statistical Bulletin 2021
TOP	The sum of imports and exports of goods and services divided by GDP in constant prices	CBN Statistical Bulletin 2021

Source: Researcher's computation (2023).

RESULT AND DISCUSSION
4.1 Descriptive Statistics

Table 2: Descriptive Statistics Result

Statistics	SD	FAIDS	EXC	INF	TOP
Mean	9.483056	2.849722	111.1836	19.31000	207.8468
Median	7.195000	1.740000	100.2500	12.54500	167.9326
Maximum	32.54000	17.38000	275.2900	72.84000	566.8724
Minimum	-1.560000	0.190000	50.17000	5.390000	0.867504
Std. Dev.	9.873769	3.463407	54.36900	17.61236	176.6557
Jarque-Bera	4.443347	181.4057	31.59773	22.74737	2.750105
Probability	0.108427	0.198110	0.239811	0.321011	0.252826
Observations	36	36	36	36	36

Source: E-view-9 output (2023)

Trade openness (TOP) respond significantly to sustainable development (SD) flowing by others, as Table 2 acquired mean value established. This suggests that the country's entrance and outflow of products and services adhered to the process of preserving resources for future generations. For the median value, a similar trend was also confirmed. Additionally, foreign aid (FAID) had the lowest maximum value, measuring 17.3 units, while trade openness (TOP) had the greatest maximum value. When it came to minimum values, external sustainable development (SD) had the lowest minimum value and exchange rate (EXC) had the highest minimum value at 50.1 units. Trade openness has the greatest values around the mean, according to the standard deviation result, followed by other factors. Furthermore, at the 5% significant level, the *Jarque-Bera* test statistics demonstrated that trade openness (TOP), exchange rates (EXC), inflation rates (INF), foreign assistance (FAID), and sustainable development (SD) were all normally distributed.

Unit Root Estimate

Table 3: Augmented Dickey-Fuller

Variables	T-Statistics	Conclusion
SD	/4.806418/ 0.0001**	I(1)
FAIDS	/5.666430/ 0000**	I(1)
EXC	/5.095163/ 00000**	I(1)
EXCH	/5.261078/ 0000**	I(1)
TOP	/5.780109/ 0000**	I(1)
** indicates significant probability at 5% level		

Source: E-view-9 output (2023)

The results of the test at initial differences and test at level for the Augmented Dickey Fuller (ADF) are displayed in Table 3. The results showed that trade openness (TOP), exchange rates (EXC), inflation rates (INF), foreign assistance (FAID), and sustainable development (SD) were not stationarity (NS) at level I (0); while, trade openness (TOP), foreign assistance (FAID), exchange rate (EXC), inflation rate (INF), and sustainable development (SD) were all stationary (S) at first level difference I(1); since their *p*-values were much below 5% level of significance.

Johansen Co-integration Estimate

Table 4: Johansen Co-integration

	Trace Statistics	Max-Eingen Statistics	
Level (Ho)	T-Statistics	T-Statistics	Conclusion
r = 0	144.6712 (69.81889)**	90.96950 (33.87687)	Long-run Established
r = 1	53.70167 (47.85613)**	36.07244 (27.58434)	Long-run Established
r = 2	17.62923 (29.79707)	13.01936 (21.13162)	Absence
r = 3	4.609872 (15.49471)	4.528563 (14.26460)	Absence
r = 4	0.081309 (3.841466)	0.081309 (3.841466)	Absence
( ) indicates Critical Value @ 5% ** *indicates long-run relationship*			

Source: E-view-9 output (2023)

The results from both Traces and Max-Eingen Statistics established the presence of two co-integrating equations. Therefore, confirmed a long-run relationship between the variables used in the model.

Dynamic Least Squares Result

Table 5: Dynamic Least Squares (DOLS) (SD:dependent Variable)

Variables	Coefficient	t-Statistic
FAIDS	1.116007	2.005853
	0.0534**	
EXC	0.050596	2.155622
	0.0387**	
INF	-0.121133	-4.129018
	0.0001**	
TOP	0.165490	4.081440
	0000**	
Constant	/0.203355	3.002162
	0084**	
R-squared	0.811569	
Adjusted R-squared	0.623137	
** indicates significant probability at 5% & 10% level		

Source: E-view-9 output (2023)

It was discovered that foreign aids (FAID), exchange rate (EXCH) and trade openness (TOP) were significantly related to sustainable development (SD) and statistically significant at 5% significance level, judging from the *p*-value that is within 0.05 and 0.1 significance level; while, the coefficient of inflation (INF) was negative and significantly related to it.

Pairwise Granger Causality Tests

Table 6: Pairwise Granger Causality Tests

Null Hypothesis:	Direction	Obs.	F-Statistic	Prob.
FAIDS does not Granger Cause SD		34	0.98541	0.0054
SD does not Granger Cause FAIDS	↔		1.43748	0.0500
EXC does not Granger Cause SD		34	0.25750	0.0047
SD does not Granger Cause EXC	↔		0.07648	0.0266
INF does not Granger Cause SD		34	3.70569	0.0369
SD does not Granger Cause INF	↔		1.41979	0.0501
TOP does not Granger Cause SD		34	4.14342	0.0261
SD does not Granger Cause TOP	→		0.41231	0.6659

Source: E-view-9 output (2023)

Table 6 Pairwise Granger Causality Tests demonstrate that, at the standard significance levels of 0.05 and 0.1, foreign aids (FAID) did indeed granger cause sustainable development (SD), and vice versa. This suggests that foreign aid (FAID) and sustainable development (SD) have a directional link. Additionally, a similar relationship between sustainable development (SD) and inflation rate (INF) and exchange rate (EXC) was found. Additionally, a one-way causal relationship between sustainable development (SD) and trade openness (TOP) was established.

DISCUSSION OF FINDINGS

Based on the *p*-value (0.0534), which is within the 0.1 significance threshold, it was established that the coefficient result of foreign aids (FAID) was directly associated to sustainable development (SD) and statistically significant at the 10% significance level. This demonstrates that foreign aid and sustainable development had a direct link. According to statistics, this suggests that, when all other factors influencing sustainable development (SD) are held constant, foreign aid has a substantial strong impact on SD. The obtained sign was consistent with theoretical positions. This discovery has economic effects since it indicates that issue related to sustainable development is receiving an increase aid from foreign institutions in form of loans, grants, and others. Hence, the provision of welfare and other benefits is contingent upon the preservation of resources for next generations via the integration and recognition of social, environmental, and economic issues. Studies, including Igor et al. (2022), Saleem et al. (2022), Perveen and Ali (2021), Asongu and Nnanna's (2018) and Yongfu et al. (2017) concluded that there is a positive and substantial link between foreign aid and sustainable development, meaning that it protects the environment. Conversely, a positive but non-significant link between the duo was found by Mohammed et al. (2018), Abeselom (2018), and Asongu and Nnanna (2018). Exchange rate (EXCH) was found to have a positive co-efficient and significant at the 0.5 significance level, with a *p*-value (0.0387) lower 0.05. According to statistics, the result suggests that while other factors are held constant, exchange rate appreciation has an increasing impact on sustainable development (SD). The implication suggests that exchange rate appreciation increases local production that are meant for exportation; therefore, increases the demand for exported local goods that adhered to sustainable development. Therefore, a direct and substantial association between exchange rate and sustainable development has been proven by research such as Younis et al. (2015), Adams and Elassal (2020), and Adams and Elassal (2020). However, research by Evan Laun (2018), Thian-Hee Yiew, and Kirikkaleli et al. (2021) found that there was an indirect link between them.

The coefficient of inflation rate (INF) was established by the DOLS to be negative and significant at the 5% significance level. This suggests that there was a 12.1% decrease in sustainable development (SD) for every 1% increase in general prices. This implies that the country's degree of sustainable development is getting worse overall. This might be explained by the fact that spiral inflation makes it difficult for individuals to abide by the laws governing environmental sustainability. Rasheed and Andrew (2022) found a substantial and unfavourable link between the two.

The estimated coefficient of trade openness (TOP) was 16.5%, and statistical significance at the 5% conventional level, as was demonstrated by the DOLS result. This result was consistent with the *a priori* expectation that was developed. The economic impact of such finding is that excessive influx of imported commodities that do not adapt to climate change worsen sustainable development.

CONCLUSION

This study appraised how foreign aid affected Nigeria's sustainable development between 1986 and 2021 using DOLS approach. According to the DOLS estimate, trade openness, exchange rates, and foreign aid had a direct and significant link with sustainable development (SD). In contrast, the inflation rate (INF) had a negative and significant relationship with SD. According to the study's findings, foreign aid, exchange rates stability and high exportation that comply with environmental sustainability boost Nigeria's sustainable development growth, but spiral inflation worsens it. As a result, the research offered the following suggestions.

i. The government must ensure that there is more inflow of foreign aids into environmental programme through declaration of state of emergency on environmental related issue. Finding from the result had shown that indeed foreign aids for sustainable development conserve resources for future generations. Therefore, helps in the overall goal of sustainable development.

ii. Apex bank should ensure exchange rate stability within the economy through maintenance of exchange rate and eradication of multiple exchange rate policy. This would go a long way in reducing spiral or volatility nature of exchange rate within the country, as well as, encourages local production to adhere strictly to sustainable development.

iii. Government should encourage liberation of the economy by ensuing that the importation and exportation of goods comply with the international standard on sustainable development.

iv. The apex bank must endure that it maintains stable general price level in order to reduce its severity effect on the sustainable development.

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