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Green Growth and Financial Development: A Path to Environmental Sustainability in Pakistan

Muhammad Faheem, Assistant Professor, School of Economics, Bahuddin Zakariya University, Multan Pakistan
***Fatima Farooq,** Associate Professor, School of Economics, Bahauddin Zakariya University, Multan, Pakistan
Asma Nousheen, M.Phil. Scholar, School of Economics, Bahauddin Zakariya University, Multan, Pakistan
Abdul Waheed, Lecturer, Lasbela University of Agriculture, Water and Marine Science, Lasbela, Pakistan

*Corresponding author's email: fatimafarooq@bzu.edu.pk

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ABSTRACT

Purpose: The pressing need to reconcile conflicting priorities—fostering economic growth, ensuring environmental sustainability, and mitigating the adverse impacts of greenhouse gas emissions—is becoming increasingly evident. Addressing these concerns, the study explore the ramifications of various factors – namely, green growth, foreign direct investment (FDI), financial development (FD), and gross domestic product (GDP) on environmental sustainability.

Design/Methodology/Approach: Drawing on data spanning from 1987 to 2022 in the context of Pakistan. This study employs the autoregressive distributed lag (ARDL) technique to check the association between variables.

Findings: The study reveals significant empirical insights. Specifically, it highlights the constructive contributions of green growth and financial development toward enhancing environmental quality. Conversely, it underscores the dual role played by GDP and FDI, acting as drivers that intensify CO_2 emissions.

Implications/Originality/Value: These findings underscore the complexity of the interplay between economic development, environmental considerations, and the pressing need for sustainable practices.

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Introduction

Our increasing reliance on fossil fuels and other nonrenewable energy sources has led to a dramatic

increase in pollution and, by extension, global warming. The effects of climate change include more unpredictable weather, higher sea levels, and dangers to ecosystems and human settlements. Finding ways to lower CO_2 emissions without slowing economic growth is the current emphasis of scholars and experts (Jafri et al., 2022). Natural disasters around the world are often blamed for the increase of greenhouse gasses, especially carbon emissions. The principal cause of environmental degradation in the last several decades and the greatest danger to Earth's ecological balance are the carbon dioxide emissions that result from these greenhouse gasses (Rafique et al., 2020; Farooq et al., 2023). A major roadblock to achieving sustainable development goals is the worsening state of our environment. Human activities exacerbate environmental catastrophes like global warming and add to pollution, making it harder and harder to strike a balance between economic expansion and environmental preservation. In order to achieve sustainable development, it is crucial for researchers and policymakers to work together to successfully reduce environmental deterioration (Rani et al., 2022). Scholars have proposed various criteria for addressing environmental instability in response to the planet's worsening environmental health. The concentration of GHGs is the most important factor contributing to pollution among these (Mehmood et al., 2021). The emissions of greenhouse gases are mostly responsible for this dangerous occurrence, which emphasizes the critical need for immediate and coordinated action to tackle and lessen its extensive effects (Mujtaba and Jena, 2021). The frequency and intensity of natural disasters are made worse by this unstable scenario, which could disrupt global climate patterns. If nations do not immediately execute efforts to rectify the situation, their GDP is predicted to fall by 2-4 percent per year by 2040. This bodes poorly for the future (Suhrab et al., 2022).

The utilization of renewable energy sources, environmentally friendly technology, and green growth plans are all part of the solution to environmental degradation (Saleem et al., 2022). For countries to achieve the sustainable development goals and especially to guarantee an unspoiled environment green growth is essential. Cleaner production processes can only be fostered through technology breakthroughs and the adoption of clean energy if we are to achieve this goal of sustainable progress (Wei et al., 2023). An increasingly popular approach to environmental protection, green growth has the ability to lessen the impact of human activities on the environment by cutting down on carbon dioxide emissions and conserving energy (Hao et al., 2021). Environmental concerns, such as intensifying global warming and severe weather occurrences, are being exacerbated by the ceaseless emission of carbon dioxide. In response to nations' growing concern about climate change, green development is becoming an essential force in reshaping the global economy (Lin and Ullah, 2023).

As host nations entice international companies with a hospitable regulatory environment, FDI significantly increases energy consumption and carbon dioxide emissions. Although FDI has many positive outcomes, it also has negative consequences, such as increasing CO_2 emissions due to the increased demand for energy needed for sustainable growth. Ironically, FDI increases environmental deterioration even as it helps host nations' economies (Farooq et al., 2023).The environmental effects on host countries are a hotly contested topic, especially in light of the ever-increasing flows of FDI into developing nations. There are different schools of thought in the theoretical literature regarding the link between FDI and pollution. FDI in developing countries may be causing environmental degradation in such countries because of their lax environmental standards, according to one theory. The Pollution Haven Hypothesis is in agreement with this point of view (Khan et al., 2023).FDI represents the transfer of technology, management ability, and information from wealthy nations to developing economies. FDI inflows may bring environmental difficulties, particularly in emerging nations. In such instances, multinational firms producing items with high pollution levels could elect to establish operations in nations with less stringent environmental rules compared to their home countries with more stringent environmental standards (Rafique et al., 2020; Sreenu, 2022).

Research has shown that the financial industry has a significant impact on environmental sustainability and economic success since the early 2000s. Unfortunately, there has been no definitive research on the link between FD and environmental quality. However, one remarkable feature stands out: FD makes green technology investments more accessible to businesses and consumers alike. In order to reduce emissions of greenhouse gases, a well-developed financial sector acts as an incentive for both consumers and companies to embrace environmentally friendly technology and sustainable practices (Emenekwe et al., 2022). On the flip side, there may be negative consequences to a more developed financial sector. Increased CO_2 emissions could be a result of manufacturing and industrial expansion, which could compromise environmental integrity. Additionally, consumers may be encouraged by financial incentives to use energy-intensive technology, which further strains environmental resources. As a result, the extensive use of these energy-hungry goods endangers ecological compatibility (Emenekwe et al., 2022). Two separate aspects comprise the interaction between FD and CO_2. First, FD can help ease credit restrictions and lower interest rates, making capital more accessible. As a result, projects that substantially depend on energy usage can be funded. Under this situation, business owners have more leeway to purchase machinery and equipment, which leads to increased energy and carbon dioxide (Ahmad et al., 2020). Financial development promotes a strong structure for enhancing R&D efforts, with a focus on developing environmentally friendly solutions to reduce CO2 emissions (Wang et al., 2022).

One interesting line of inquiry is looking at how rising GDP is related to environmental damage. It is suggested in scholarly works that there is an inverse link, which is called the environmental Kuznets curve (EKC). According to this notion, pollution levels were typically highest during the early stages of economic development. The trend towards environmental improvement, however, becomes apparent once a particular level of economic development has been attained (Mehmood et al., 2021; Faheem et al., 2023).The threat of environmental contamination grows in coupled with a country's economic growth. Clean energy development should thus be a national priority if governments want to enjoy long-term economic success. A silent cost of economic expansion is the ever-increasing depletion of natural resources, which in turn keeps the environmental degradation cycle going. Societies advance via competition and advancement, but these things aren't free. The delicate environment endures these stresses with determined ability (Faheem et al., 2023).

In order to address these critical issues, we propose a new line of inquiry into this field. The paper's contributions can be outlined as follows: Despite a growing body of research focusing on the influence of FDI on the environment. We make the following contributions to the literature on green growth, FDI, FD, GDP, and CO emissions: (1) The present research examines the impact of GDP, GG, FD, and FDI on carbon emissions in Pakistan using the most up-to-date data available for the period 1987–2022. In Pakistan, the economic structure underwent substantial changes over the course of the study period, and various variables, time periods, and methodologies were employed in these investigations. It is critical to comprehend the extent to which Pakistan continues to benefit from the relationship outlined in the research currently in publication. Secondly, Green growth's impact on pollution levels has been limited investigated in any prior research. In particular, developing nations like Pakistan's framework lacks empirical evidence.

Literature Review

Employing the AMG model, the attachment between green growth, renewable energy, technological innovation, inward financial inflow, and CO_2, during the years 1990 to 2018, for the top 10 green future index countries, was reported by Wei et al. (2023). They found that all studied variables minimize CO_2 emissions. The connection between green growth, green innovation, ICT, trade openness, and CO2 emissions during the years 1990 to 2020, for Pakistan was inspected by Lin and Ullah. (2023); the estimated findings of the paper revealed that ICT lessens CO_2, while,

green growth and green innovation boost environmental quality. Saleem et al. (2022), during the years 1990 to 2018, employed the CS-ARDL model connection between green growth, renewable energy, environmental taxes, GDP, environmental tax, and CO2 emission for 12 Asian economies. The verifiable calculation of the paper disseminated that GDP enhanced CO2 emissions, while, environmental taxes, green growth, domestic credit to private sector decline CO2. Adopting the QARDL approach, Chien et al. (2021) probed the connection between renewable energy, green growth, ecological innovation, environmental taxes and CO2 emissions, covering the year 1990 to 2015 for US economy. The factual results of the experiment uncovered that green growth, renewable energy, and environmental taxes abate CO_2 emissions. The attachment between green growth, human capital, green growth square, environmental tax, and CO_2 emissions adopting the NARDL model was probed by Hao et al. (2021) for G-7 countries. The verifiable outcomes of the calculation uncovered that all studied variables mitigate CO2. Loganathan et al. (2014) explored the connection between green taxation, GDP, and the environment during the years 1974 to 2020, for Malaysia. The observed calculation of the paper manifest that green taxation and GDP deteriorate the environmental quality, while, GDP square cleaned the environment

Employing ARDL technique for Pakistan from 2004 to 2021, Faheem et al. (2023) inspected the tie between financial inclusion, trade, GDP, FDI, and environmental sustainability. The empirical findings of study revealed that trade openness and financial inclusion played important role in minimizing CO_2, while, FDI and GDP enhance CO_2 emissions. For Pakistan from 2005 to 2021, Faheem et al. (2023) employed ARDL approach to examine the nexus between fiscal decentralization renewable energy, GDP, NRE and CO_2 emissions. They found that renewable energy and fiscal decentralization negatively associated CO_2 emissions, while GDP and NRE expand CO2 emissions. For Portugal, during 1990 to 2019, Kirikkalaleli et al. (2023) scrutinized the connection between GDP, RNE and CO_2 emissions using NARDL technique. The empirical findings of research showed that GDP in both shocks enhance CO_2 emissions, while, renewable energy in both shocks mitigate CO_2 emissions. Employing ARDL, for Europe and Central Asia during 1971 to 2016 Mohsin et al. (2022) probed the causal linkage between FDI, GDP, non-renewable energy and CO_2 emissions. The empirical evidence confirmed that GDP, FDI and NRE enhance CO_2 emissions. For China from 1962 to 2018, Aslam et al., (2021) employed ARDL approach to investigate the association between trade, GDP, population growth, industrialization and CO_2 emissions. The empirical findings of study revealed that trade, population growth and industrialization promote CO_2 emissions. Wang and Li (2021) utilized Panel threshold regression to investigate the bond between urbanization, life expectancy rate and CO2 emissions. The study analyzed data from 154 countries. They found that life expectancy, population and GDP impact on CO_2 emissions was nonlinear. Mehmood et al. (2021) investigated the affinity between GDP, FDI, institutional quality and CO_2, using ARDL approach for three developing countries. They found that in case of Pakistan and India GDP and FD enhance CO_2 emissions but institutional quality mitigates CO_2, while in Bangladesh FD and institutional quality mitigate CO_2 emission but GDP promote CO_2.For 150 largest economies from 1990 to 2015, Mendonca et al. (2020) consider the relationship between population growth, GDP and co2 emission Hierarchical regression modeling. They found that GDP and population growth worked as catalyst for CO_2, while, renewable energy mitigate CO_2.

Khan et al. (2023) documented the connection between FDI, FD, human capital, GDP, and CO_2 emissions for 108 developing countries from 2000 to 2016. The empirical findings of the research proposed that FDI, GDP, energy consumption, and human capital increased environmental pollution, while, GDP square cleaned the environment. Farooq et al. (2023) for China, during the years 1995 to 2021, discovered the affiliation between economic policy uncertainty, FDI, urbanization, and CO_2. The empirical outcomes of the research disclosed that FDI, urbanization, and EPU exacerbate CO_2, conversely, renewable energy accelerated renewable energy. For China, during the years 2000 to 2018, Wang et al. (2022) inspected the association between FDI, patent,

energy intensity, and CO_2. The verifiable outcomes of the paper disclosed that FDI, technology, and energy intensity purify the environmental quality, in addition, GDP and urbanization demolish the environmental quality. Jafri et al. (2022) for China, analyzed the tie between remittances, FDI, GDP, energy consumption, and CO_2 from the year 1981 to 2019 utilizing the ARDL and NARDL approach. The empirical outcomes of the paper disclosed that all study variables enhanced environmental pollution. The tie between FDI, GDP, good governance, human capital, export, financial services development, and CO_2 for India, was probed by Sreenu, (2022). They found that GDP, human capital, export, financial service development, and good governance deteriorated the environmental quality, Conversely, FDI exacerbated the environmental quality. Rafique et al. (2021) identified the affinity between FDI, urban population, FD index, energy intensity, GDP, and CO_2 emission for BRICS countries, during the year 1990 to 2017. The AMG results for this paper disclosed that FDI, technological innovation, and FD index support the environmental quality, while, GDP, urban population, and energy demolish the environmental quality. Adopting the NARDL model, during the years 1986 to 2014, Mujtaba and Jena, (2021) reviewed the connection between oil price, economic growth, FDI, energy consumption, and CO_2 emission. The verifiable outcomes of the research in the case of India disclosed that oil price deteriorate the environmental quality in both shocks, meanwhile, FDI in positive shocks damages the environmental quality, conversely in negative shocks clean the environmental quality, In addition, GDP reacted opposite FDI in both shocks.

When looking at how FD affects environmental quality, the empirical results have been mixed. FD can have both beneficial and bad effects on the environment. In addition, prior research has shown that there are multiple pathways via which financial development impacts environmental quality. This brief literature review classifies the data linking financial development to environmental quality into two broad categories: direct channels and indirect channels. For South Asia countries, during the years 1980 to 2018, Islam, (2022) established the correlation between FD, energy use, GDP, and CO2 emissions by adopting the PMG model. The verifiable outcomes of the research displayed that all studied variables exacerbate CO2 emissions. The attachment between FD, renewable energy, GDP, globalization, and CO2 emissions covering the year 1990 to 2015, for N-11 countries, was probed by Wang et al. (2022). The observed calculation unveiled that FD, renewable energy, and globalization Purify the environmental quality, while, GDP destroys the environmental quality. Jiang et al. (2022) covering the years 1995 to 2018, for 57 B&R countries, investigated the connection between FD, institutional quality, natural resources, economic growth, urban population, and CO2 emissions. The factual results of the paper confirmed that institutional quality and renewable energy support environmental quality, while, GDP, FD, and natural resources enhanced environmental pollution. For South Asian countries, Rani et al. (2022) documented the correlation between globalization, industrialization, labor force, FD, GDP, and CO2 emissions. They found that FD lessened CO2, conversely, GDP, industrialization, globalization, education, and labor force accelerated CO2 emissions. Adopting the PMG model for 37 SSA countries, during the years 2000 to 2016, Emenekwe et al. (2022) underlined the nexus between GDP, trade, FD, energy consumption, and CO2. The observed evidence of the paper reported that GDP square and FD clean the environmental quality; in addition, urbanization, energy use, and trade deteriorate the environmental quality. From 1990 to 2017, for 90 BRI countries, Ahmad et al. (2020) reported the bond between trade, GDP, FD, FDI, urbanization, and CO2 emissions. The practical findings of the paper that FDI, trade, and GDP square clean the environmental quality; conversely GDP, FD, and urbanization demolish the environment. Majeed et al. (2020) adopting NARDL model, tested the tie between ICT, FD and CO2 for Pakistan. The verifiable calculations of the paper uncovered that FD, energy use, and economic growth deteriorate the environmental quality.

Methodology

This study has taken the data from Pakistan from 1987 to 2022. All the data for this study is

obtained from WDI, except green growth taken from OECD STAT. CO_2 stands for carbon dioxide emissions, measured as (CO_2 emissions kt) GG displays green growth measured as (Production-based CO_2 emissions), FD indicates financial development measured as (Domestic credit to private sector % of GDP), FDI stand for foreign direct investment measured as (Foreign direct investment, net inflows (% of GDP) and GDP is measured as (GDP growth (annual %)). The main purpose of this research is to investigate the impact of green growth, foreign direct investment, GDP and financial development on CO_2 emissions.

This study examined the association between CO_2 emissions green growth, FD, FDI and GDP. The econometric model of this study can be written as

CO_2 = f (GG, FD, FDI, GDP) ……. (1)

Econometric equation is given as under

$$CO_{2t} = \hbar_0 + \hbar_1 GG_t + \hbar_2 FD_t + \hbar_3 FDI_t + \hbar_4 GDP_t \ \ldots\ldots\ldots(2)$$

The ARDL estimation equations are following:

$$\Delta CO_{2t} = \hbar_0 + \sum_{i=1}^{j} \hbar_{1i} \Delta CO_{2t-1} + \sum_{i=0}^{k} \hbar_{2i} \Delta GG_{t-i} + \sum_{i=0}^{l} \hbar_{3i} \Delta FD_{t-i} + \sum_{i=0}^{m} \hbar_{4i} \Delta FDI_{t-i} + \sum_{i=0}^{n} \hbar_{5i} GDP_{t-i}$$
$$+ \alpha_1 CO_{2t-1} + \alpha_2 GG_{t-1} + \alpha_3 FD_{t-1} + \alpha_4 FDI_{t-1} + \alpha_5 GDP_{t-1} + \mu_t \qquad \ldots(3)$$

ECM equation

$$\Delta CO_{2t} = \hbar_0 + \sum_{i=1}^{j} \hbar_{1i} \Delta CO_{2t-1} + \sum_{i=0}^{k} \hbar_{2i} \Delta GG_{t-i} + \sum_{i=0}^{l} \hbar_{3i} \Delta FD_{t-i} + \sum_{i=0}^{m} \hbar_{4i} \Delta FDI_{t-i} + \sum_{i=0}^{n} \hbar_{5i} \Delta GDP_{t-i} + \lambda ECT - 1 + vt_t$$

Table 1: Descriptive Statistics and Correlation Matrix

	CO2	GG	FD	FDI	GDP
Mean	126867.3	121.3747	0.23988	0.937118	4.132487
Median	132304.2	129.17	0.217541	0.696146	4.260088
Maximum	198738.8	185.605	0.370925	3.035719	7.831256
Minimum	59026	55.97	0.120507	0.309595	-1.27409
Std. Dev.	42118.58	39.4282	0.072711	0.66589	1.996716
Skewness	0.064202	0.013951	0.152883	1.996275	-0.28024
Kurtosis	1.793102	1.858686	2.306732	6.247189	3.285186
Jarque-Bera	2.025499	1.792141	0.789406	36.41645	0.543765
Probability	0.363219	0.40817	0.67388	0	0.761944
Sum	4186621	4005.366	7.916028	30.92489	136.3721
Sum Sq. Dev.	5.68E+10	49746.66	0.16918	14.18911	127.5799
CO2	1				
GG	0.985797	1			
FD	0.077118	0.12883	1		
FDI	0.001589	-0.00763	0.401024	1	
GDP	-0.04022	0.027425	0.167802	0.027251	1

The presence of unit root was assessed using the ADF, IPS, and PP test statistics because of their robustness in handling panel data (Dickey and Fuller, 1981; Phillips and Perron, 1988), in addition to how effectively they work with both small and large datasets (Zhang et al., 2019). These methods provide an easy multiple-choice way to verify the existence of unit roots. In each panel and cross-section, they use p-values from separate unit root tests (Al-Mulali and Ozturk, 2015).

Table 2: Unit Root Tests

Variable	ADF		PP	
	Level	First Difference	Level	First Difference
CO_2	-1.132	-4.463***	-0.478	-4.487***

GG	-1.432	-4.321***	-1.309	-5.254***
FDI	-0.199	-5.320***	-1.091	-6.543***
FD	-0.592	-3.709***	-0.698	-4.765***
GDP	-1.735	-5.232***	-2.233***	-5.351***

***** shows significance level at 1%.**

Based on the work of Pesaran et al. (2001), this research makes use of the ARDL bound approach. We use this approach since it lets us look at equations where the variables are stationary at a level (I(0)) and first difference (I(1)). Checking for co-integration among the variables is a prerequisite to using the ARDL model. The ARDL bound test is used to check if there is co-integration in long-run and short-run relationships.

There are a number of benefits that support using the ARDL model in this study. To start, the ARDL model really excels when working with a small sample size. And secondly, it works fine in cases when the variables are stationary in one of two forms—the level form (I(0)) or the difference (I(1))—or both. Thirdly, both the long-run and short-run coefficients can be computed at the same time using the ARDL model.

Table 3: ARDL bound approach

F-statistics	k	Range	Critical values	
			I(0) bound	I(1) bound
6.732	4	10%	2.45	3.52
		5%	2.86	4.01
		1%	3.74	5.06

The negative coefficient of green growth shows that green growth is beneficial in minimizing CO_2 emissions. The coefficient of green growth -0.43 implies that 1% rise in GG will be responsible for -0.043% reduction in CO_2 emission. Green growth is found significant at a 1% level. Our findings are parallel with Lin and Ullah (2023) for Pakistan, Saleem et al. (2022) for 12 Asian countries. The empirical results showed that FDI and CO_2 emissions are positively connected with each other. The positive coefficient of FDI revealed that 1% increase in FDI will lead to a 0.128% upsurge in CO_2 emissions. The positive coefficient shows the devastating role of FDI in environmental sustainability. Our results are similar with Wang et al. (2022) for China, Sreenu, (2022) for India. Examining the relationship between FD and CO_2 we have found that they are negatively associated. The results imply that one unit expansion in FD causes a -0.1926% decline in CO_2 emissions. FD was found significant at the 1% level. The nature of association shows the advantageous role of FD in environmental sustainability. Our estimations are alike Wang et al. (2022) for N-11 countries, and Rani et al. (2022) for South Asian countries.

Table 4: ARDL and Diagnostic Test Results

Long Run			
Variables	Coefficient	[S.E]	{T-st}
GG	-0.0432***	[0.0173]	{1.1754}
FDI	0.1281**	[0.0209]	{4.4232}
FD	-0.1926***	[0.0432]	{5.1320}
GDP	0.0320**	[0.0232]	{2.4509}
C	9.4802***	[0.2953]	{31.4153}

Short run

	coefficient	[S.E]	{T-ST}
D(GG)	-0.0275**	[0.0209]	{1.2232}
D(FDI)	0.13547***	[0.0354]	{3.3201}
D(FD)	-0.2053***	[0.0519]	{-2.3921}
D(GDP)	0.0211***	[0.0132]	{1.4313}
CointEq(-1)	-0.5121 ***	[0.1021]	{-3.6315}
Diagnostic Test Results			
R^2	0.943		
Adj. R^2	0.925		
Durbin-Watson	2.234		
LM test	1.321(0.205)		
Jarque-Bera	0.276(0.709)		
Hetero	1.653(0.166)		
Ramsey reset	0.876(0.298)		
CUSUM	Stable		
CUSUMQ	Stable		

Note: **, * denotes significance level at 5% and 1%, respectively.**

According to ARDL results, GDP was found positively connected with CO_2 emissions which implies that 1% rise in GDP will cause a 0.0320% hike in CO_2 emissions. GDP plays a harmful role in environmental sustainability as it promotes CO_2 emissions. GDP was found significant at a 5% level. Our results look the same Faheem et al. (2023) for Pakistan, Kirikkalaleli et al. (2023) for Portugal.

Conclusion and Recommendations

This study investigated the impact of green growth, FDI, FD, and GDP on environmental sustainability for Pakistan from 1987 to 2022, using the ARDL technique. The empirical findings of this study revealed that FDI and GDP enhance CO_2 emissions, while, GG and FD mitigate CO_2 emissions. The results showed very clearly that GDP and FDI are devastating for environmental sustainability that's why the government of Pakistan should take some strict actions to prevent the harmful impact of FDI and GDP. Strict environmental policies can be helpful to overcome this problem. As shown by empirical findings GG and FD play beneficial roles in improving environmental quality. These findings suggest that the government of Pakistan should focus on FD and GG to improve the environment as well as economic growth.

The answer to reducing Pakistan's CO_2 emissions, according to the research, lies in maximizing green growth. These results highlight the critical need for the Pakistani government to take the lead in promoting environmentally friendly technologies and establishing a framework for their broad adoption through various incentive programmes. Pakistan can achieve its environmental goals by adopting this sustainable approach and shifting its focus from non-renewable resources to the vast possibilities of renewable energy for power generation and production. This change in

approach not only reduces negative impacts on the environment, but it also lays the groundwork for a more sustainable and resilient future for future generations. Given the strong link between foreign direct investment (FDI) and CO_2 emissions, this study provides strong evidence that the Pakistani government should change its strategy. Multinational firms operating within Pakistan's borders need to be more regulated and overseen, according to the recommendation. The government's goal is to promote economic growth and environmental sustainability by reducing CO2 emissions linked to foreign investment activities through the implementation of strong monitoring systems. A proactive approach towards achieving a delicate balance between economic development and ecological preservation is highlighted by this proposed line of action. It highlights Pakistan's resolve to stay true to its environmental stewardship and long-term sustainability obligations while it navigates the challenges of modernization.

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