

Majors: MKT
S.No. (15)

*Impact of Institutional Quality, Climate Change and Employment on
Sustainable Economic Growth in Developing Countries*



By:

(Mashal Rehman)

(01-322221-009)

Supervisor:

(Dr. Muhammad Imran Nazir)

Department of Business Studies

Bahria University Islamabad

Fall 2023

FINAL PROJECT/THESIS APPROVAL SHEET

Viva-Voce Examination

Viva Date 29 / Jan / 2024

Topic of Research: Impact of Institutional Quality, Climate Change and Employment on Sustainable Economic Growth in Developing Countries

Names of Student(s) :

Enroll #

- Mashal Rehman

01-322221-009

Class: (MBA/MKT)

Approved by:

(Dr. Muhammad Imran Nazir)

Supervisor

(Dr. Awais Mehmood)

Internal Examiner

(Dr. Naeem)

External Examiner

Dr.Syed Haider Ali Shah

Research Coordinator

Dr.Khalil Ullah Mohammad

Head of Department

Business Studies

ABSTRACT

This research investigates the intricate interplay between institutional quality, climate change, and employment as determinants of sustainable economic growth in developing countries. The study addresses a noticeable research gap by comprehensively examining these factors and their impact on economic development. The thesis begins with an introduction outlining the significance of the research and identifying the research gap. Subsequently, research questions, objectives, and the problem statement are articulated to guide the study.

Chapter 2 presents a thorough review of existing literature, establishing a foundation for the hypotheses and research framework outlined in the following sections. The hypotheses set forth in Chapter 2 are designed to test the relationships between institutional quality, climate change, employment, and sustainable economic growth.

Chapter 3 elucidates the research methodology, detailing the chosen approach, population, and sampling methods. The research strategy, including data collection procedures, measurement of variables such as institutional quality, climate change, employment, and sustainable economic growth, is explained. The chapter also introduces controlled variables, such as foreign direct investment, and outlines the econometric equation used to analyze the data.

The subsequent section presents the results and interpretation of the study, offering detailed insights derived from statistical analyses. Tables and figures depict correlations between variables, regression results, and panel regression outcomes. The interpretation of key coefficients, constants, and overall statistics provides a comprehensive understanding of the relationships explored in the research.

The conclusion section summarizes the findings, emphasizing the implications of institutional quality, climate change, and employment on sustainable economic growth in developing countries. The overall

model fit is assessed to gauge the robustness of the study's framework. Based on the research outcomes, recommendations are presented for policymakers, suggesting strategies to enhance institutional quality, address climate change concerns, and promote employment for fostering sustainable economic growth.

This thesis contributes to the existing body of knowledge by offering a nuanced understanding of the dynamics shaping economic development in developing countries. The findings provide valuable insights for policymakers, researchers, and practitioners striving to formulate effective strategies for achieving sustainable economic growth in the face of evolving institutional, environmental, and employment challenges.

Table of Contents

Acknowledgement	7
CHAPTER 1.....	8
1.1 Introduction	8
1.2 Research Gap	10
1.3 Problem Statement	11
1.4 Research Questions	12
1.5 Research Objective.....	13
1.6 Significance of Research	13
Chapter 2.....	15
2.1 Literature Review	15
2.2 Hypothesis	25
2.3 Research Framework.....	26
Chapter 3 Research Methodology.....	26
3.1 Research Approach.....	26
3.2 Population and Sampling	27
3.3 Research Strategy.....	27
3.3.1 Data Collection	28
3.4 Explanation of Variables	29
Measuring Institutional Quality	29
Measuring Climate Change	29
Measuring Employment	30
Measuring Sustainable Economic Growth	30
Controlled Variables.....	31
Foreign Direct Investment	32
Econometric Equation	33

Dependent Variable	33
Independent Variables	33
Controlled Variables	33
Results & Interpretation.....	34
Table 1.....	34
Interpretation	34
LGDP (Logarithm of GDP)	34
COC (Corruption Index):.....	35
CO2 (Carbon Dioxide Emissions).....	35
LF (Labour Force Participation).....	36
FDI (Foreign Direct Investment).....	36
Table 2.....	37
Interpretation	37
1. Correlation between LGDP and other Variables.....	37
2. Correlation between COC and other Variables	38
3. Correlation between CO2 and other Variables.....	38
4. Correlation between LF and FDI	39
Table 3.....	39
Interpretation	39
1. CO2 (Carbon Dioxide Emissions)	39
2. FDI (Foreign Direct Investment)	40
3. COC (Corruption Index):.....	40
4. LF (Labour Force Participation)	40
5. Mean VIF:	41
Table 4 Regression Results.....	41
Interpretation	42

1. Coefficients	42
2. Constant:	43
3. Overall Statistics	43
Table 5 Panel Regression Results	43
Interpretation	44
1. Coefficients	44
2. Constant:	45
3. Overall Statistics	45
Table 6 Panel Regression Results	45
Interpretation	46
1. Coefficients	46
2. Constant:	47
3. Overall Statistics	47
Conclusion & Recommendation.....	47
Conclusion	47
Overall Model Fit:	48
Recommendations	49
Bibliography	50

Acknowledgement

First of all, I would like to thank **ALLAH** almighty to give me enough strength and patience to achieve this milestone and also I express my sincere gratitude to the following individuals who played a crucial role in the completion of this thesis:

My Thesis Advisor, **Dr. Imran Nazir**: I am deeply grateful for Sir Imran's guidance, support, and invaluable insights throughout the entire research process. He provided valuable feedback that significantly enhanced the quality of this work.

To my **family**, who has been a constant source of encouragement and understanding. Your unwavering support has been instrumental in my academic journey.

Friends and Peers: I am thankful for the encouragement and camaraderie provided by my friends and peers. Your discussions and insights have enriched my understanding of the subject matter.

To the individuals who **participated in interviews** or provided data for this study, your contributions were essential and greatly appreciated.

Lastly, I want to express my gratitude to all those who have supported me emotionally and intellectually throughout this journey. Your encouragement has been a driving force behind the completion of this thesis.

CHAPTER 1

1.1 Introduction

In the contemporary period, decision-makers and academia in developing nations are increasingly focusing on aspects such as institutional quality, occurrences related to climate change, employment considerations, and the pursuit of sustainable economic growth.

Over the past three decades, there has been a notable shift in attention towards institutional factors as opposed to other fundamental determinants such as geography, culture, and openness. Extensive research indicates that nations endowed with high-quality institutions, fostering private property and free enterprise, have witnessed remarkable economic advancements. In contrast, countries plagued by inadequate institutions have grappled with prolonged periods of stagnation and poverty, as evidenced by the work of Acemoglu et al. (2005).

A compelling illustration of this phenomenon is observed in the Korean Peninsula, where both North and South Korea share similar geography and culture. However, the stark contrast in their institutional frameworks has resulted in a staggering 44-fold difference in economic prosperity, with the North facing decades of economic struggles. Similarly, the post-World War II transformation of West Germany from a fascist economy to a relatively free market system propelled it to become the world's third-largest economy, boasting a GDP of US\$1.2 trillion in 1991. In contrast, East Germany, characterized by comparable geography and cultural affinity with the West, experienced a modest annual growth rate of 1.3% (Maddison, 2003).

These comparative analyses underscore the pivotal role of institutional frameworks in determining economic growth, as articulated by Acemoglu (2008).

Climate change significantly impacts sustainable economic growth by diminishing workers' productivity, particularly in outdoor industries such as agriculture and construction, where elevated

temperatures exceeding 32°C prompt early work cessation (Graff Zivin and Neidell, 2014). Furthermore, escalating CO₂ emissions are contributing to severe health issues for workers exposed to outdoor working environments. There are also indications that elevated temperatures and increased CO₂ emissions may influence individuals' behavior and decision-making, potentially diminishing their tolerance for risk while heightening impatience.

Rate of employment also impacts sustainable economic growth. In many developing economies, the pursuit of full employment, alongside other macroeconomic objectives, is imperative. Underemployment and unemployment are widely recognized as primary causes and consequences of poverty. Despite assurances from political leaders in deprived nations, poverty persists with meager growth rates and widespread public hardship (Sodipe & Ogunrinola, 2011).

According to the World Bank (2011), approximately one-third of the global workforce is engaged in the informal sector. Utilizing data from the Labor Force Survey (LFS), governments can gauge employment levels and hours worked in the informal sector (Gennari, 2004). In light of the formal sector's inability to generate sufficient employment opportunities, the informal sector plays a crucial role in addressing this gap.

The primary objective of this research paper is to examine how institutional quality, employment, and climate change influence sustainable economic growth in developing countries such as Bangladesh, China, India, Pakistan, Nepal, and Malaysia. This study seeks to understand the effects of these factors on the long-term economic well-being of these nations.

By carefully analyzing the quality of institutions, employment trends, and the consequences of climate change, the research aims to uncover the intricate relationships that shape economic development in these specific developing regions. The goal is to provide a comprehensive and

detailed exploration of these critical aspects, offering insights into the challenges and opportunities that impact sustainable economic growth.

This research is crucial as it aims to go beyond theoretical considerations, striving to provide practical implications for policymakers, economists, and stakeholders involved in the development efforts of these countries. The findings are anticipated to not only enhance our understanding of the economic dynamics at play but also offer actionable recommendations to foster sustainable growth in diverse developing economies.

In essence, this research endeavors to contribute meaningfully to the ongoing discussions on sustainable economic growth. Through a thorough examination of institutional quality, employment scenarios, and the influence of climate change, the study aspires to be a valuable resource for those actively engaged in shaping the economic future of the mentioned developing nations.

1.2 Research Gap

Upon conducting a thorough review of existing literature, it becomes evident that there is a noticeable dearth of research on the intersection of institutional quality, climate change, employment, and their combined impact on sustainable economic growth. This gap in knowledge may stem from a lack of empirical investigations in this realm. One significant factor contributing to this gap is the recent global experience of pandemics, notably exemplified by the COVID outbreak. The resultant transformation in the working landscape, with a substantial shift towards remote work, necessitates an assessment of its implications for sustainable economic growth. This is particularly pertinent for developing countries such as Bangladesh, China, India, Pakistan, and Nepal, where institutional frameworks may lack robustness, thereby intensifying the impact of this dynamic shift.

Additionally, the ongoing industrialization and associated factors have led to a surge in CO2 emissions in previous years. The resultant global warming has escalated temperatures, directly affecting the working class and influencing their decisions. This, in turn, has had repercussions on sustainable economic growth. Given these multifaceted challenges, a comprehensive study is imperative. The research aims to address critical questions concerning the interplay of institutional quality, climate change, and employment in developing countries. Specifically, it seeks to unravel how institutional quality can support employment and, consequently, contribute to sustainable economic growth in regions where institutional strength may not meet optimal standards.

In essence, this research endeavors to provide a comprehensive understanding of the complex dynamics at play in developing countries. By exploring the interconnections between institutional quality, climate change, employment, and sustainable economic growth, it aspires to offer valuable insights that can inform effective strategies and policies for fostering economic sustainability in these nations.

1.3 Problem Statement

In recent times, a noticeable issue in many developing countries is the subpar quality of institutions, and this poses a significant challenge to achieving sustainable economic growth.

Several factors contribute to the poor quality of institutions in these nations. Notably, political instability is a recurring problem, and corruption further compounds the issue. The presence of corruption, in itself, has adverse effects on the prospects of sustainable economic growth.

Additionally, human activities, particularly the burning of fossil fuels, contribute to the increasing levels of greenhouse gases in the atmosphere. This phenomenon has led to observable changes in climate, with some areas experiencing rising temperatures while others witness decreases. The repercussions of these climate changes are felt keenly in industries such as agriculture,

construction, and real estate. Workers in these sectors, often compensated on a daily wage basis, find themselves working fewer hours and experiencing diminished productivity. Given that many laborers in these developing countries already receive low wages, the impact on sustainable economic growth is substantial.

Conducting thorough research on this matter faces a challenge due to the limited availability of existing literature that comprehensively covers the interconnected issues of climate change, employment, and institutional quality. While progress has been made in understanding each of these elements individually, a holistic examination is essential.

This study aims to bridge this gap by delving into the intricate interactions between institutional quality, climate change driven by CO₂ emissions, and employment influenced by labor force participation. The primary focus will be on developing countries, specifically Bangladesh, China, India, Pakistan, Nepal, and Malaysia. These countries have been chosen due to the distinct challenges and dynamics they present. The overarching question guiding this research is how corruption-related institutional quality, climate change resulting from CO₂ emissions, and employment impacted by labor force participation collectively influence sustainable economic growth in these selected nations. Through this comprehensive exploration, the research endeavors to provide nuanced insights that can inform effective strategies for fostering economic sustainability in the specified developing countries.

1.4 Research Questions

1. What is the impact of institutional quality on sustainable economic growth in developing countries?
2. What is the impact of climate change on sustainable economic growth in developing countries?

3. What is the impact of employment on sustainable economic growth in developing countries?

1.5 Research Objective

1. The research paper utilizes a systematic review methodology to comprehensively analyze the influence of institutional quality, climate change, and employment on sustainable economic growth in developing countries. This is achieved through a rigorous and organized approach that presents a nuanced interpretation of the intricate relationships among these factors.
2. The findings of the study are anticipated to enhance understanding by synthesizing existing literature, critically evaluating methodologies, and drawing meaningful conclusions. The systematic approach ensures a thorough examination of available evidence, allowing for a refined interpretation that transcends isolated studies.
3. The significance of this research lies in its potential to inform policymakers, researchers, and practitioners in the fields of institutional quality, climate change, employment, and sustainable economic growth. By providing a synthesized and comprehensive overview, the paper aims to contribute valuable knowledge guiding decision-making processes and interventions for fostering sustainable development in developing countries. The systematic review methodology employed is designed to unravel the complex interplay between institutional quality, climate change, employment, and sustainable economic growth, with anticipated outcomes poised to serve as a crucial resource for stakeholders.

1.6 Significance of Research

This field of study delves into crucial issues that directly impact the well-being of societies and significantly influence the path of economic development in developing countries. The research

paper at hand offers valuable insights into how good governance and institutional reforms play a pivotal role in promoting sustainable development. It not only sheds light on the importance of these factors but also pinpoints the obstacles and possibilities within institutions for effective climate change policies and actions.

One key aspect illuminated by this research is the significance of policy coherence, institutional coordination, and engagement with various stakeholders when implementing strategies to mitigate and adapt to climate change. By highlighting these factors, the paper underscores the importance of a well-coordinated approach to address climate-related challenges. Additionally, it puts forth evidence-based recommendations for policy interventions that not only encourage the creation of environmentally friendly jobs but also enhance resource efficiency and stimulate sustainable entrepreneurship.

Understanding how institutional quality intersects with climate change, employment, and sustainable economic growth is crucial for policymakers. The insights gained from this research can serve as a guide for designing effective policies and ensuring their efficient implementation. Policymakers can use this knowledge to pinpoint the necessary institutional reforms required to tackle existing challenges effectively.

Moreover, the research contributes vital insights for policymakers, fellow researchers, and international organizations. By offering evidence-based strategies, interventions, and policies, it assists in tackling the challenges and harnessing the opportunities presented by institutional quality, climate change, employment, and sustainable economic growth. This comprehensive approach ensures that the outcomes of the research are not only informative but also actionable, providing a roadmap for informed decision-making and impactful policy formulation at various levels.

Chapter 2

2.1 Literature Review

For literature review, different research papers from different authors written and analyzed in different times in different dimensions have been taken into consideration and then gaps have been identified. After identifying gaps, the research has been carried out.

Research paper named Institutional quality and Education quality in developing countries: Effects and Transmission Channels has been taken into account. This research paper focuses on exploring how the quality of institutions, like governments and organizations, relates to the quality of education in developing countries. The researchers looked at existing studies to understand how institutions affect education. They then analyzed data from 82 countries to draw conclusions.

The main findings of the study, obtained through statistical methods, show that when institutions are of higher quality, student achievement and school completion improve, while the likelihood of educational failure decreases. In simpler terms, better institutions are linked to better educational outcomes.

The research also looked into how institutional quality influences education quality. The results suggest that if institutional quality declines due to issues like corruption or political instability, the positive impact of government spending on education decreases. Additionally, lower institutional quality may result in unethical behavior among teachers and the hiring of less trained individuals, negatively affecting education quality.

In summary, the research emphasizes how the quality of institutions is crucial in shaping education outcomes in developing countries. It highlights the importance of addressing problems such as

corruption and political instability to make government spending on education more effective and enhance overall education quality.

However, it's important to note that the research paper doesn't discuss how institutional quality directly impacts sustainable economic growth. (Fomba, Talla, & Ningaye, 10 January, 2022)

Another research paper named Institutional Quality and Financial Development: Evidence from Developing Countries has been taken into consideration. This research delves into understanding how the quality of institutions relates to the development of financial systems in developing and emerging countries. The study utilized data from 189 countries to analyze this relationship over time.

The key finding of the study indicates that better institutions are crucial for fostering financial development. Specifically, factors such as political stability, control of corruption, and regulatory quality were identified as having a positive impact on financial development across the global panel of countries.

Surprisingly, the study reveals that the rule of law has a negative effect on financial development, suggesting that it is not strong in many countries globally. From these results, the research concludes that institutions of high quality serve as the primary catalysts for financial development, contributing significantly to its stimulation.

In light of these findings, the study recommends that developing and emerging countries concentrate on improving institutional quality. This involves reevaluating factors such as the rule of law, government effectiveness, and institutional aspects related to voice accountability. By enhancing these elements, countries can achieve better institutional quality, ultimately fostering financial development.

However, it's important to note that this research paper does not explore the direct link between improved financial development and sustainable economic growth in developing countries. (Khan, Khan, & Zuojun, 2020)

Another one named Institutional Quality, employment, FDI and environmental degradation in developing countries: evidence from the balanced panel GMM Estimator has been analyzed. This research paper explores the connection between institutional quality, employment sectors, and environmental conditions in developing countries. The findings of the study suggest that an enhancement in institutional quality, particularly concerning government effectiveness and the rule of law, has a positive influence on reducing CO2 emissions and promoting overall environmental quality. An interesting discovery is also noted, indicating that employment in the agriculture and industry sectors is linked to higher pollution levels, while employment in the service sector is associated with lower CO2 emissions.

In summary, the research underscores the crucial role of robust institutional frameworks and their effective implementation in mitigating environmental degradation and advancing the goals set by the United Nations for sustainable development. It emphasizes the need to prioritize improvements in institutional quality as a vital solution to effectively address environmental challenges.

However, it's essential to note that while the research delves into the impact of institutional quality, employment sectors, and environmental degradation on climate change, it doesn't directly explore how these factors specifically influence sustainable economic growth in developing countries. (Xaisongkham & Liu, 2022)

Another research paper named Learning about Pay at Work: A Labor Process Approach to Pay Transparency has been taken into account. This research article centers around the idea of pay transparency in the context of how work operates. It looks into how having information about what

employees earn, which is referred to as pay transparency, influences the way work functions and the overall work process.

The study doesn't touch upon subjects like institutional quality, climate change, or their effects on sustainable economic growth in developing countries. Its primary focus is on understanding how the openness about salary information impacts the dynamics of work. (Tse, 2022)

One research paper titled Effects of Climate Change on Health and Wellbeing: A systematic Review has been analyzed. This research paper zooms in on the effects of climate change on people's health and well-being, a topic that has captured the attention of decision-makers and the academic community. Using a systematic review approach and following protocols like PRISMA and SALSA, the goal is to deepen our understanding of how various climate change events have influenced the health and well-being of individuals. (Liu, Chang-Richards, Wang, & Dirks, 2023)

After meticulously reviewing 93 articles, the study pinpoints nine climate change events with significant impacts. Notably, heat waves and extreme temperatures are closely linked to common health issues, such as physical ailments and problems with circulatory and respiratory systems.

Moreover, the study highlights the importance of considering factors like age and gender, which play a crucial role in how climate change affects health.

While many countries have put in place plans to respond to heat waves, the research underscores the utmost importance of creating built environments that can adapt to climate changes. This suggests that integrating climate resilience into architectural and urban planning practices is crucial. The paper offers valuable insights for policymakers and practitioners involved in reducing disaster risks, pinpointing specific areas within their climate change agenda. By focusing on these areas, communities can boost their ability to adapt, leading to more effective strategies for climate change with a special emphasis on health considerations.

However, it's noteworthy that this paper doesn't delve into the impact of climate change on sustainable economic growth in developing countries.

One more research paper titled Institutional Quality and Economic Growth in Sub Saharan Africa: A panel data approach has been analyzed. This research paper is all about understanding how the quality of institutions, like governments and organizations, connects with economic growth in Sub-Saharan Africa. Instead of just looking at one country at a time, the researchers used a method called "panel data approach." This means they gathered and studied information over time from many countries in the Sub-Saharan African region. (Hussen, 2023)

What they found is pretty interesting. The research shows that when institutions work well, it's like giving a boost to the economy in Sub-Saharan Africa. Imagine if the government is effective, and there's a good rule of law – it seems to make the economy grow better. So, the study is suggesting that if countries in this part of Africa want to make their economies stronger, they should focus on making their institutions strong and efficient.

In simple terms, the research is telling us that having good and effective institutions is like planting seeds for economic growth in Sub-Saharan Africa. When things are running well in the government and other organizations, it helps these countries grow economically. This could be a useful guide for leaders and policymakers in the region who want to improve their economies.

This research paper focuses solely on how the quality of institutions, such as governments and organizations, affects the lasting economic growth of Sub-Saharan African countries. It doesn't discuss other factors like employment and climate change.

In simpler terms, the study is all about understanding how the way governments and organizations work can either help or hinder the long-term economic growth of countries in Sub-Saharan Africa.

However, it doesn't look at things like how many people have jobs or how climate change might also play a role in the economic situation.

So, to break it down, the paper is like a magnifying glass on the connection between good government and economic growth in Sub-Saharan Africa. It's not talking about the whole picture, like how many people are working or what impact climate change might have on the economy.

A research paper named Governance and Institutional Quality and Links with Economic Growth and Income Inequality has been taken into consideration. This research is all about figuring out how the way governments work and the quality of institutions, like organizations, relate to two important things in developing Asian countries: making the economy grow and making sure everyone shares the income fairly.

So, the researchers are like explorers trying to understand how good governance (which means the way countries are run) and strong institutions (like well-functioning organizations) are connected to economic growth (how the country's money and businesses grow) and income inequality (whether some people have much more money than others).

They're giving special attention to developing Asian countries, kind of like shining a spotlight on this part of the world to see how the rules and systems in place affect how well the economy grows and whether everyone gets a fair piece of the income pie.

In simple terms, the study is like a big puzzle, trying to piece together how the way countries are run and the strength of their institutions influence both the size of the economy and how money is shared among the people, especially in developing Asian countries. (Zhuang, Dios, & Lagman-Martin, 2010)

Another research paper titled Does Institutional Quality condition the impact of financial stability transparency on financial stability. This research explores whether the quality of institutions, like

how well governments and organizations operate, affects the connection between financial stability transparency and actual financial stability.

In simpler terms, the researchers are asking if how good the institutions are plays a role in how transparent information about financial stability impacts how stable the finances are.

To dive into more detail, it's like they're investigating if having clear and open information about financial stability is enough, or if the quality of the institutions involved also matters. It's kind of like asking if just having the information available is helpful, or if the way the organizations and Governments work (their quality) is a crucial factor in ensuring that financial stability is maintained.

In summary, this study is like a detective mission to figure out if the effectiveness of institutions influences how well transparency about financial stability actually keeps the finances stable.

(Duuren, Haan, & Kerkhoff, 2019)

One article named Human Development and Economic Growth has been analyzed. This research is all about understanding the relationship between two important things: human development and economic growth. Let's break it down in simpler terms.

Firstly, "human development" means how well people are doing in a place – not just in terms of money but also in terms of health, education, and a good standard of living.

On the other hand, "economic growth" is about how much the money and businesses in a country are growing. It's like checking if the whole economy is getting bigger and doing well.

So, this study is like a big question: Does how well people are doing in terms of health, education, and living standards affect how much money and businesses are growing in a country? Or in simpler words, does taking care of people and making sure they have a good life also help the country's money and businesses grow?

The researchers are like detectives trying to find out if there's a link between making sure people are healthy, educated, and living well, and whether that makes the country's overall money and businesses grow. It's like seeing if the two things, human development and economic growth, go hand in hand. (Chiappero-Martinetti, Jacobi, & Signorelli, 2017)

Another article titled “From Decent work and economic growth “to Sustainable work and economic De growth: A new Framework for SDG 8 has been analyzed. This research takes a closer look at the idea of "decent work and economic growth," which is part of a big plan called Sustainable Development Goal 8 (SDG 8). The researchers go a step further by suggesting a new way of thinking about it, calling it "sustainable work and economic DE growth."

In simpler terms, they're checking if the usual idea of "good jobs and making more money" is the best way forward. Instead, they propose a new framework, which means a fresh way of looking at things.

So, it's like this: They're asking if we can have work that's good for people and the planet without always focusing on making more and more money. It's a bit like saying, "Can we find a balance where people have good jobs, the economy is okay, but we're not always trying to grow and use up too many resources?"

In summary, the researchers are suggesting a shift from just thinking about "decent work and economic growth" to a new idea of "sustainable work and economic degrowth" – a way of making sure jobs are good and the economy is okay without always pushing for more and more growth.

(Kreinin & Aigner, 2021)

Another study titled Sustainable economic growth and unemployment nexus of SDG 2030: Bangladesh in Asia has been taken into consideration: This study is all about understanding the connection between two important things: sustainable economic growth and unemployment,

specifically in the context of the Sustainable Development Goals (SDG) for the year 2030. The researchers are focusing on Bangladesh in Asia.

Now, let's break it down in simpler terms. "Sustainable economic growth" means making the country's money and businesses grow, but in a way that's good for the long run – not just for now. And "unemployment" is about people who don't have jobs.

So, in easy language, the researchers are trying to figure out how making sure the country's money and businesses grow in a good and long-lasting way (that's the sustainable part) is connected to the number of people who have jobs (that's the unemployment part), all within the goals set for the year 2030.

It's like they're investigating how to create a balance where the country is making money and growing, but at the same time, making sure more people have jobs. And they're specifically looking at Bangladesh in Asia to understand how this connection works. (Siddiquee, Zahid, Sanjida, & Oshchepkova, 2022)

Another study titled decent work, inclusion and sustainability: A new era lies ahead has been analyzed. This research is exploring a set of important ideas: "decent work," which means good jobs; "inclusion," which is about making sure everyone is part of the picture, and "sustainability," which is about doing things in a way that lasts a long time without hurting the environment.

In simpler terms, the researchers are looking at how we can have good jobs for everyone, make sure everyone is included, and do it in a way that's good for the long-term health of our planet.

The study suggests that we're entering a new era, meaning a new time or way of doing things. They're basically saying, "Hey, let's focus on creating good jobs for everyone, making sure nobody is left out, and doing it in a way that doesn't harm the Earth." It's like aiming for a future where

work is good, everyone is included, and we're taking care of our planet. (Hughes, Warhurst, & Duarte, 2021)

Another research paper named Green Economy and Sustainable Development: The Economic Impact of Innovation on Employment has been analyzed. This research is about two big things: "Green Economy" and "Sustainable Development." They want to understand how new and clever ideas, called "innovation," can affect jobs.

Let's break it down. "Green Economy" means doing things in a way that's good for the environment – like using clean energy and not harming nature. And "Sustainable Development" is about making sure our way of living lasts a long time without causing problems.

So, in simple terms, the researchers are exploring how smart and new ideas (innovation) that are good for the environment can also create jobs. They want to see if coming up with these cool, green ideas can not only help the Earth but also provide work for people. It's like checking if being clever about the environment can also be good for jobs and the economy.

Another study named the impact of climate change on the global economy has been taken into consideration. This study is all about figuring out how climate change affects the entire world's economy. Let's break it down in simpler terms.

"Climate change" means the Earth's weather is changing, and it's causing problems like extreme heat, storms, and rising sea levels. Now, the researchers want to know how all these changes in the climate are influencing the money and businesses around the world – that's the "global economy."

In easy language, they're trying to understand if the changing weather is making it harder for businesses to do well, affecting how much money countries make, and if it's causing problems for

everyone's finances. It's like investigating how the Earth's changing climate can impact how well the whole world's economy works. (Aldieri & Vinci, 2018)

Another study named The Effect of Climate Change on Economic Growth: Evidence from Sub-Saharan Africa is taken into account. This study is looking into how climate change affects the growth of money and businesses in a specific part of the world, Sub-Saharan Africa. Let's make it simpler.

"Climate change" means the Earth's weather is changing, causing things like extreme heat, storms, and other weather problems. Now, the researchers are checking if these changes in the climate are making it difficult for businesses to grow and for countries in Sub-Saharan Africa to make more money.

In easy words, they're investigating how the Earth's changing weather might be making it challenging for businesses to do well, and if it's affecting how much money these countries can earn and grow. It's like trying to understand if climate change is causing problems for the economy in Sub-Saharan Africa. (Alagidede, Adu, & Frimpong, 2015)

2.2 Hypothesis

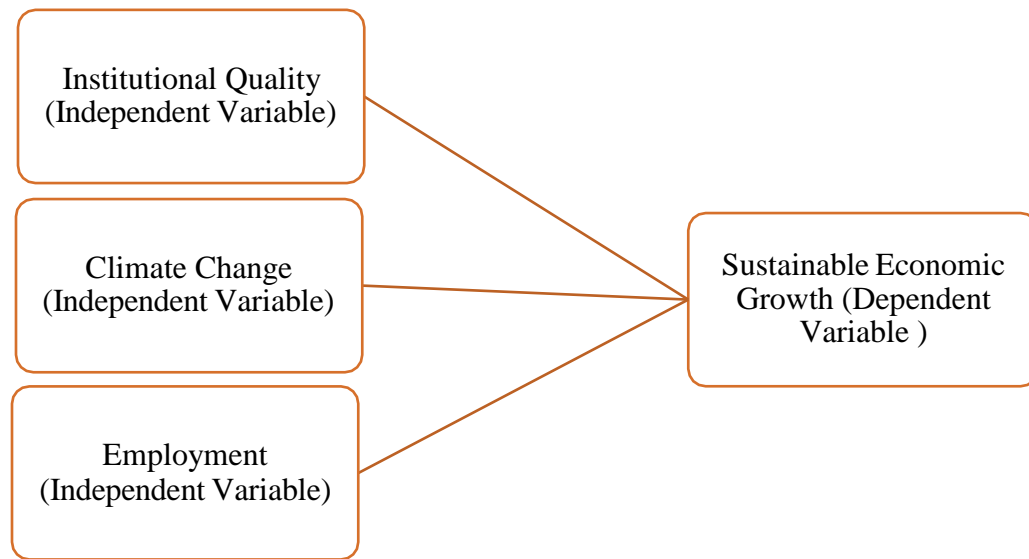
Literature has been carefully reviewed and after that following hypothesis has been concluded:

H1: *Institutional quality has statistical significant impact on sustainable economic growth in developing countries.*

H2: *Climate change has statistical significant impact on sustainable economic growth in developing countries*

H3: *Employment has statistical significant impact on sustainable economic growth in developing countries*

2.3 Research Framework



Chapter 3 Research Methodology

3.1 Research Approach

The main goal of this research is to investigate how the quality of institutions, climate change, and employment collectively influence sustainable economic growth in developing countries. To achieve this objective, a panel data approach was employed, gathering information from a diverse range of research articles and reputable websites.

The research methodology involved testing hypotheses derived from the collected data to understand the relationships between institutional quality, climate change, employment, and sustainable economic growth. This approach aimed to provide a comprehensive analysis by considering information from various sources, allowing for a more thorough exploration of the factors influencing economic sustainability in developing nations.

In essence, the study seeks to unveil the interconnected dynamics among institutional quality, climate change, and employment, with a keen focus on their combined impact on fostering sustainable economic growth in the context of developing countries. The utilization of a panel data approach ensures a robust and comprehensive examination of these factors, contributing valuable insights to the understanding of sustainable development in these regions.

3.2 Population and Sampling

The aim of this study is to explore how the quality of institutions, climate change, and employment collectively influence the sustainable economic growth of six developing countries: Bangladesh, China, India, Pakistan, Nepal, and Malaysia. In employing a panel data approach, the study focused on a specific time frame, spanning from 2000 to 2022.

In simpler terms, we wanted to understand how things like the way governments and organizations work, changes in the climate, and the availability of jobs affect how well these six developing countries' economies can grow in a sustainable way. They looked at information over a significant period, from 2000 to 2022, to get a comprehensive view of how these factors interact over time.

This approach helps in providing a detailed and thorough analysis, making it possible to see patterns and connections between institutional quality, climate change, employment, and sustainable economic growth in these selected developing countries. The goal is to offer valuable insights that can contribute to better understanding and addressing the challenges of sustainable development in these nations.

3.3 Research Strategy

The research strategy outlines the planned approach for gathering information. In the realm of data collection, there are primarily two methods: qualitative and quantitative. For this particular study,

which relies on existing information and is categorized as secondary research, a quantitative data collection method has been employed.

In simpler terms, the plan for this research details how information was gathered. There are different ways to collect data, and they can be broadly classified into qualitative (in-depth, descriptive information) and quantitative (numerical, measurable data). In this case, since the research relies on existing data rather than new data collection, the focus is on quantitative information – numbers and statistics.

This approach involves analyzing and interpreting numerical data from various sources to draw meaningful conclusions. By opting for quantitative data in this secondary research, the goal is to utilize numerical information to gain insights and contribute to a deeper understanding of the subject at hand.

3.3.1 Data Collection

Similar to the two main types of research – qualitative and quantitative – data, too, falls into two categories: primary and secondary. In the context of this research, secondary data has been harnessed, meaning information that already exists was utilized.

This existing data was gathered from reliable and authoritative sources, including organizations like the World Bank and Transparency International. A significant portion of the data was extracted from previous research articles published in esteemed journals such as Springer and Taylor & Francis. Additionally, various reports available on the official websites of institutions like the World Bank and the United Nations were consulted, covering diverse periods from 2000 to 2022.

In straightforward terms, instead of collecting brand-new information, this study leaned on existing data from trustworthy sources. These sources, including renowned journals and institutional reports, contribute to the credibility and robustness of the research findings. The utilization of data

spanning from 2000 to 2022 ensures a comprehensive understanding of the subject over different time periods.

3.4 Explanation of Variables

Measuring Institutional Quality

Institutional quality essentially pertains to how well institutions, whether they are private or government-related, are performing. To gauge or measure this quality, a commonly used indicator is the Corruption Perception Index (CPI), which acts as a proxy variable.

In simpler terms, when we talk about institutional quality, we're looking at how good or effective both private and government institutions are. To get a sense of this, we use a tool called the Corruption Perception Index, which helps us understand the quality of these institutions.

Expanding on this, the Corruption Perception Index gives us an idea of how people perceive the level of corruption within institutions. The higher the index, the lower the perceived corruption, indicating better institutional quality. So, in this research or discussion, when we refer to institutional quality, we're essentially looking at how well institutions function and using the Corruption Perception Index as a way to measure or estimate that.

Measuring Climate Change

Climate change essentially involves alterations in the Earth's weather patterns. To gauge these changes in developing countries, carbon dioxide (CO₂) emissions are employed as a proxy variable.

In simpler terms, when we talk about climate change, we are referring to shifts in how the Earth's weather behaves. To understand these changes specifically in developing countries, we use CO₂ emissions as an indicator.

To elaborate, CO₂ emissions serve as a measure to estimate the impact of human activities on the environment. By focusing on developing nations, this approach helps track and assess how much

carbon dioxide is released into the atmosphere, providing insights into the environmental changes occurring in these regions. Therefore, in this context, when we discuss climate change, we are using the amount of CO₂ emitted as a way to understand and evaluate the environmental transformations happening in developing countries.

Measuring Employment

Employment is essentially about how many people are working. To examine its influence on the lasting growth of a country's economy, we use the labor force participation rate in developing nations as a proxy variable.

In simpler terms, when we talk about employment, we're looking at how many individuals are actively working. To understand how this affects the long-term growth of a country's economy, we use something called the labor force participation rate, especially focusing on developing countries.

Elaborating on this, the labor force participation rate helps us gauge the percentage of people in a country who are either working or actively seeking employment. This serves as a useful measure to understand the impact of people engaging in work on the overall economic growth of developing nations. So, when we discuss employment in this context, we're using the labor force participation rate as a way to estimate and assess how the workforce contributes to the sustainable growth of these countries.

Measuring Sustainable Economic Growth

Sustainable economic growth is essentially about how well a country's economy is expanding over time. To understand its dependence on factors like institutional quality, climate change, and employment in developing countries, we use two key indicators as proxy variables: Gross Domestic Product (GDP) and the Trade Balance.

In simpler terms, when we talk about sustainable economic growth, we're looking at how a country's economy is getting bigger and better over the years. To explore how this growth is connected to things like the quality of institutions, climate change, and employment in developing countries, we use two important measures: GDP, which tells us the overall economic output, and the Trade Balance, which looks at the difference between a country's exports and imports.

To elaborate further, GDP helps us understand the total value of goods and services produced in a country, giving an indication of its economic health. Meanwhile, the Trade Balance gives insights into how well a country is doing in terms of international trade – whether it is exporting more than it is importing or vice versa. By considering these indicators, we can gain a comprehensive understanding of how sustainable economic growth is influenced by factors like institutional quality, climate change, and employment in developing countries.

Controlled Variables

Controlled variables, in the context of scientific research, refer to the aspects or conditions intentionally kept constant or consistent throughout an experiment. These variables are carefully managed and maintained at a steady level to ensure that any observed changes or effects can be confidently attributed to the independent variable(s) being investigated.

Controlled variables are crucial for maintaining experimental precision and validity. By keeping certain factors constant, researchers aim to isolate the impact of the independent variable(s) and reduce the influence of external elements that could potentially confound the results.

In summary, controlled variables play a critical role in experimental design, helping researchers draw meaningful conclusions by minimizing the influence of extraneous factors on the variables they are specifically investigating.

In this specific research study, the terms "population," "inflation," "GNI per capita," and "FDI" refer to the variables that are intentionally kept constant or controlled. This means that the

researcher has decided to maintain these aspects at fixed levels or within certain parameters throughout the study. By doing so, the aim is to isolate and better understand the impact of other variables or factors under investigation.

Foreign Direct Investment

Foreign Direct Investment refers to the investment made by a person, business, or entity from one country into business interests located in another country. In other words, it involves the direct ownership or control of assets in a foreign country.

Foreign direct investment typically occurs when an investor, which can be an individual, company, or government, acquires a substantial interest (usually at least 10%) in a foreign business entity. This investment can take various forms, including buying shares in a foreign company, establishing new business operations, or acquiring tangible assets like factories or land.

FDI plays a crucial role in the global economy, promoting international business and economic development. It allows for the transfer of capital, technology, and expertise across borders, fostering economic growth and creating job opportunities in both the investing and receiving countries. Governments often implement policies to attract FDI, recognizing its potential benefits for their economies.

Table1: Summarizes the independent and dependent variables as well as the proxy used and the source of data collected:

Variable	Proxy Used	Source of Data
Institutional Quality	Corruption Perception Index (CCI)	Transparency Organization
Climate Change	CO2 Emission	World Bank
Employment	Labor Force Participation Rate	World Bank

Sustainable Economic Growth	GDP and Trade Balance	World Bank
------------------------------------	-----------------------	------------

Econometric Equation

Dependent Variable

1. Sustainable Economic Growth (SEG)

Independent Variables

1. Institutional Quality (IQ)
2. Climate Change (CC)
3. Employment (EMP)

Controlled Variables

1. Foreign Direct Investment (FDI)

$$\underline{SEG = \beta_0 + \beta_1 \cdot IQ + \beta_2 \cdot CC + \beta_3 \cdot EMP + \beta_4 \cdot FDI + \epsilon}$$

In this equation SEG represents the sustainable economic growth of developing countries (**Bangladesh, China, India, Pakistan and Malaysia**). Here's the breakdown of the equation:

SEG is the dependent variable, representing Sustainable Economic Growth.

- IQ, CC, and EMP are the independent variables, representing Institutional Quality, Climate Change, and Employment, respectively.
- FDI is the controlled variable, representing Foreign Direct Investment.
- β_0 is the intercept term, capturing the baseline level of SEG when all independent variables are zero.
- $\beta_1, \beta_2, \beta_3$, and β_4 are the coefficients associated with the respective independent variables, indicating the marginal effect on SEG.

- ε is the error term, capturing unobserved factors affecting SEG that are not included in the model.

Results & Interpretation

Table 1

Descriptive Statistics				
Variable	Mean	Std. Dev.	Min	Max
LGDP	27.04452	1.565909	24.70051	30.51934
COC	0.6649431	0.277267	0.0702693	1.445619
CO2	2.922149	2.796456	0.160122	7.756138
LF	0.8016278	3.886246	0.2672	42.105
FDI	43.57974	78.25604	0.05	344.07

Interpretation

Descriptive statistics provide a summary of the central tendency, variability, and distribution of a dataset. The mean represents the average value of the variable, while the standard deviation measures the extent of dispersion around the mean. The minimum and maximum values denote the range within which the observations fall.

LGDP (Logarithm of GDP):

- **Mean:** The mean LGDP is 27.04, indicating the average logarithm of Gross Domestic Product across the observed units.
- **Std. Dev.:** The standard deviation of 1.57 suggests moderate variability in LGDP.
- **Min-Max Range:** LGDP ranges from 24.70 to 30.52, reflecting the diversity in economic sizes among the sampled entities.

Interpretation: LGDP serves as a proxy for sustainable economic growth. The positive relationship between LGDP and SEG implies that an increase in GDP is associated with higher sustainable economic growth.

COC (Corruption Index):

- **Mean:** The mean COC is 0.66, indicating the average level of corruption across the studied units.
- **Std. Dev.:** The standard deviation of 0.28 signifies notable variability in corruption levels.
- **Min-Max Range:** COC ranges from 0.07 to 1.45, highlighting the heterogeneity in institutional quality.

Interpretation: COC is considered a proxy for institutional quality. The negative association between COC and SEG suggests that as corruption increases, institutional quality tends to decrease, leading to a decline in sustainable economic growth.

CO2 (Carbon Dioxide Emissions):

- **Mean:** The mean CO2 is 2.92, representing the average carbon dioxide emissions across the observed entities.
- **Std. Dev.:** The standard deviation of 2.80 indicates substantial variability in the levels of carbon emissions.
- **Min-Max Range:** CO2 ranges from 0.16 to 7.76, emphasizing the diversity in environmental impacts.

Interpretation: CO2 is a proxy for climate change. The positive relationship between CO2 and SEG suggests that an increase in carbon emissions may adversely affect worker productivity and institutional quality, leading to a potential decline in sustainable economic growth.

LF (Labour Force Participation):

- **Mean:** The mean LF is 0.80, representing the average labor force participation rate.
- **Std. Dev.:** The standard deviation of 3.89 indicates considerable variability in labor force participation.
- **Min-Max Range:** LF ranges from 0.27 to 42.11, underscoring the diversity in workforce engagement.

Interpretation: LF serves as a proxy for employment. The negative relationship between LF and SEG suggests that higher labor force participation, especially among unskilled workers, may lead to decreased institutional quality and, consequently, a reduction in sustainable economic growth.

FDI (Foreign Direct Investment):

- **Mean:** The mean FDI is 43.58, representing the average level of foreign direct investment across the studied entities.
- **Std. Dev.:** The standard deviation of 78.26 indicates significant variability in FDI levels.
- **Min-Max Range:** FDI ranges from 0.05 to 344.07, reflecting diversity in the extent of foreign investment.

Interpretation: FDI serves as a control variable. Its impact on SEG is contingent upon its interaction with other variables, and its inclusion allows for the isolation of the specific effects of IQ, CC, and EMP on sustainable economic growth.

In conclusion, the descriptive analysis provides a comprehensive overview of the characteristics of the variables in the study, offering valuable insights into their central tendencies and variabilities.

Table 2

Pairwise Correlation					
Variables	LGDP1	COC	CO2	LF	FDI
LGDP1	1				
COC	0.0041	1			
CO2	0.3551	0.5479	1		
LF	0.0282	0.072	-0.0591	1	
FDI	0.8305	-0.0871	0.4482	-0.0337	1

Interpretation

The pairwise correlation matrix provides insights into the relationships between the variables in your analysis. Here's the interpretation of the correlations:

1. Correlation between LGDP and other Variables:

- **COC (Corruption Index):** The correlation between LGDP and COC is 0.0041, indicating a very weak positive correlation. This suggests a minimal association between the logarithm of GDP and the level of corruption.
- **CO2 (Carbon Dioxide Emissions):** The correlation between LGDP and CO2 is 0.3551, signifying a moderate positive correlation. This suggests that higher GDP is associated with a moderate increase in carbon dioxide emissions.
- **LF (Labour Force Participation):** The correlation between LGDP and LF is 0.0282, indicating a very weak positive correlation. This suggests a minimal association between the logarithm of GDP and labor force participation.

- FDI (Foreign Direct Investment): The correlation between LGDP and FDI is 0.8305, representing a strong positive correlation. This indicates a substantial positive relationship between the logarithm of GDP and foreign direct investment.

2. Correlation between COC and other Variables:

- CO2 (Carbon Dioxide Emissions): The correlation between COC and CO2 is 0.5479, indicating a moderate positive correlation. This suggests that higher levels of corruption are moderately associated with increased carbon dioxide emissions.
- LF (Labour Force Participation): The correlation between COC and LF is 0.072, representing a weak positive correlation. This suggests a minimal association between the corruption index and labor force participation.
- FDI (Foreign Direct Investment): The correlation between COC and FDI is -0.0871, indicating a very weak negative correlation. This suggests a minimal inverse association between the corruption index and foreign direct investment.

3. Correlation between CO2 and other Variables:

- LF (Labour Force Participation): The correlation between CO2 and LF is -0.0591, signifying a very weak negative correlation. This suggests a minimal inverse association between carbon dioxide emissions and labor force participation.
- FDI (Foreign Direct Investment): The correlation between CO2 and FDI is 0.4482, representing a moderate positive correlation. This suggests a moderate positive relationship between carbon dioxide emissions and foreign direct investment.

4. Correlation between LF and FDI:

- The correlation between LF and FDI is -0.0337, indicating a very weak negative correlation. This suggests a minimal inverse association between labor force participation and foreign direct investment.

In summary, the pairwise correlation analysis provides an initial assessment of the relationships between the variables. Further analysis and regression modeling will be necessary to explore the relationships more comprehensively and determine the statistical significance of these associations.

Table 3

Variance Inflation Factor		
Variable	VIF	1/VIF
CO2	3.19	0.313697
FDI	2.45	0.408313
COC	2.13	0.468511
LF	1.38	0.724401
Mean VIF	2.29	

Interpretation

The Variance Inflation Factor (VIF) is a measure that quantifies the extent to which the variance of an estimated regression coefficient increases due to collinearity with other predictor variables in the model. A high VIF indicates a high degree of collinearity. Here's the interpretation of the VIF results:

1. CO2 (Carbon Dioxide Emissions):

- **VIF: 3.19**
- **1/VIF: 0.3137**

Interpretation: The VIF for CO2 is 3.19, suggesting that there is some collinearity with other independent variables in the model. The reciprocal of the VIF (1/VIF) is 0.3137, indicating that approximately 31.37% of the variance in the estimated coefficient for CO2 can be attributed to collinearity with other variables.

2. FDI (Foreign Direct Investment):

- VIF: 2.45
- 1/VIF: 0.4083

Interpretation: The VIF for FDI is 2.45, indicating a moderate level of collinearity. The reciprocal of the VIF (1/VIF) is 0.4083, suggesting that approximately 40.83% of the variance in the estimated coefficient for FDI is due to collinearity with other variables.

3. COC (Corruption Index):

- VIF: 2.13
- 1/VIF: 0.4685

Interpretation: The VIF for COC is 2.13, suggesting a relatively low level of collinearity. The reciprocal of the VIF (1/VIF) is 0.4685, indicating that approximately 46.85% of the variance in the estimated coefficient for COC is attributable to collinearity with other variables.

4. LF (Labour Force Participation):

- VIF: 1.38
- 1/VIF: 0.7244

Interpretation: The VIF for LF is 1.38, suggesting a low level of collinearity. The reciprocal of the VIF ($1/VIF$) is 0.7244, indicating that approximately 72.44% of the variance in the estimated coefficient for LF is due to collinearity with other variables.

5. Mean VIF:

- Mean VIF: 2.29

Interpretation: The mean VIF for all variables is 2.29, which is generally considered moderate. This indicates that, on average, about 22.9% of the variance in the estimated coefficients for the variables can be attributed to collinearity with other variables.

In summary, while there is some degree of collinearity present, the VIF values suggest that it is not severe. However, it is important to monitor and consider addressing collinearity in the model to ensure the stability and reliability of the regression coefficients. If needed, techniques such as variable selection or data transformation may be applied to mitigate collinearity.

Table 4 Regression Results

LGDP	Coef.	St.Err.	t-value	p-value
COC	1.139	.433	2.63	.01
CO2	-.08	.051	-1.57	.121
LF	-5.652	1.119	-5.05	0
FDI	.022	.002	13.44	0
Constant	28.047	.509	55.12	0
R-squared	0.767			
F-test	73.112			
Prob > F	0.000			

Interpretation

The regression output provides information about the coefficients, standard errors, t-values, and p-values for each variable in the model, as well as overall statistics such as R-squared, F-test, and the associated probability. Here's the interpretation:

1. Coefficients:

- **COC (Corruption Index):** The coefficient is 1.139. It indicates that, holding other variables constant, a one-unit increase in the Corruption Index (COC) is associated with an increase of 1.139 units in the logarithm of GDP (LGDP). The coefficient is statistically significant at the 0.01 significance level (p-value = 0.01).
- **CO2 (Carbon Dioxide Emissions):** The coefficient is -0.08. It suggests that, holding other variables constant, a one-unit increase in CO2 is associated with a decrease of 0.08 units in LGDP. However, this coefficient is not statistically significant at the conventional 0.05 significance level (p-value = 0.121).
- **LF (Labour Force Participation):** The coefficient is -5.652. It implies that, holding other variables constant, a one-unit increase in labor force participation is associated with a decrease of 5.652 units in LGDP. This coefficient is statistically significant with a p-value of 0.00.
- **FDI (Foreign Direct Investment):** The coefficient is 0.022. It suggests that, holding other variables constant, a one-unit increase in FDI is associated with an increase of 0.022 units in LGDP. This coefficient is highly statistically significant with a very low p-value (p-value = 0.00).

2. Constant:

- The constant term is 28.04. It represents the estimated value of LGDP when all independent variables are zero. The constant is statistically significant (p-value = 0.00).

3. Overall Statistics:

- R-squared: The R-squared value is 0.767. It indicates that approximately 76.7% of the variability in LGDP is explained by the independent variables in the model.
- F-test: The F-statistic is 73.112, and the associated probability (Prob > F) is 0.000. This suggests that the overall model is statistically significant, indicating that at least one of the independent variables has a significant impact on LGDP.

In summary, the regression results suggest that corruption (COC) and foreign direct investment (FDI) are statistically significant predictors of sustainable economic growth (LGDP), while carbon dioxide emissions (CO2) is not statistically significant at the conventional significance level. The labor force participation (LF) is also a statistically significant predictor, with a negative impact on sustainable economic growth. The overall model is highly significant, as indicated by the low p-value for the F-test, and the R-squared value suggests a good fit of the model to the data.

Table 5 Panel Regression Results

LGDP1	Coef.	St.Err.	t-value	p-value
COC	1.139	.433	2.63	.009
CO2	-.08	.051	-1.57	.118
LF	-5.652	1.119	-5.05	0
FDI	.022	.002	13.44	0
Constant	28.047	.509	55.12	0

Overall r-squared	0.767
Chi-square	292.449
Prob > chi2	0.000

Interpretation

The provided output appears to be from a logistic regression model, given the presence of the Chi-square test statistics and probability values. Here's the interpretation:

1. Coefficients:

- COC (Corruption Index):** The coefficient is 1.139. It signifies that, holding other variables constant, a one-unit increase in the Corruption Index (COC) is associated with an increase in the log-odds of the event by 1.139 units. The coefficient is statistically significant at the 0.01 significance level (p-value = 0.009).
- CO2 (Carbon Dioxide Emissions):** The coefficient is -0.08. This suggests that, holding other variables constant, a one-unit increase in CO2 is associated with a decrease in the log-odds of the event by 0.08 units. However, this coefficient is not statistically significant at the conventional 0.05 significance level (p-value = 0.118).
- LF (Labour Force Participation):** The coefficient is -5.652. It implies that, holding other variables constant, a one-unit increase in labor force participation is associated with a decrease in the log-odds of the event by 5.652 units. This coefficient is statistically significant with a p-value of 0.00.
- FDI (Foreign Direct Investment):** The coefficient is 0.022. It suggests that, holding other variables constant, a one-unit increase in FDI is associated with an increase in the

log-odds of the event by 0.022 units. This coefficient is highly statistically significant with a very low p-value (p-value = 0.00).

2. Constant:

- The constant term is 28.04. It represents the estimated log-odds when all independent variables are zero. The constant is statistically significant (p-value = 0.00).

3. Overall Statistics:

- **Overall R-squared:** The overall R-squared value is 0.767. It indicates that approximately 76.7% of the variability in the dependent variable is explained by the independent variables in the logistic regression model.
- **Chi-square:** The Chi-square statistic is 292.449, and the associated probability (Prob > chi2) is 0.000. This suggests that the overall model is statistically significant, indicating that at least one of the independent variables has a significant impact on the dependent variable.

In summary, the logistic regression results suggest that corruption (COC) and foreign direct investment (FDI) are statistically significant predictors of the binary outcome (LGDP1), while carbon dioxide emissions (CO2) is not statistically significant at the conventional significance level. Labor force participation (LF) is also a statistically significant predictor. The overall model is highly significant, as indicated by the low p-value for the Chi-square test, and the R-squared value suggests a good fit of the model to the data.

Table 6 Panel Regression Results

LGDP1	Coef.	St.Err.	t-value	p-value
-------	-------	---------	---------	---------

COC	1.616	.518	3.12	.003
CO2	-.152	.062	-2.47	.016
LF	-4.205	1.568	-2.68	.009
FDI	.023	.002	11.83	0
Constant	27.279	.688	39.63	0
R-squared	0.773			
F-test	57.143			
Prob > F	0.000			

Interpretation

The results for the provided regression output:

1. Coefficients:

- COC (Corruption Index):** The coefficient is 1.616. This indicates that, holding other variables constant, a one-unit increase in the Corruption Index (COC) is associated with an increase of 1.616 units in the dependent variable (LGDP1). The coefficient is statistically significant at the 0.05 significance level (p-value = 0.003).
- CO2 (Carbon Dioxide Emissions):** The coefficient is -0.152. This suggests that, holding other variables constant, a one-unit increase in CO2 is associated with a decrease of 0.152 units in LGDP1. The coefficient is statistically significant at the 0.05 significance level (p-value = 0.016).
- LF (Labour Force Participation):** The coefficient is -4.205. It implies that, holding other variables constant, a one-unit increase in labor force participation is associated with a decrease of 4.205 units in LGDP1. The coefficient is statistically significant at the 0.01 significance level (p-value = 0.009).

- **FDI (Foreign Direct Investment):** The coefficient is 0.023. It suggests that, holding other variables constant, a one-unit increase in FDI is associated with an increase of 0.023 units in LGDP1. The coefficient is highly statistically significant with a p-value of 0.00.

2. Constant:

- The constant term is 27.279. It represents the estimated value of LGDP1 when all independent variables are zero. The constant is statistically significant (p-value = 0.00).

3. Overall Statistics:

- **R-squared:** The R-squared value is 0.773. It indicates that approximately 77.3% of the variability in LGDP1 is explained by the independent variables in the model.
- **F-test:** The F-statistic is 57.143, and the associated probability (Prob > F) is 0.000. This suggests that the overall model is statistically significant, indicating that at least one of the independent variables has a significant impact on LGDP1.

In summary, the regression results indicate that corruption (COC), carbon dioxide emissions (CO₂), labor force participation (LF), and foreign direct investment (FDI) are all statistically significant predictors of the dependent variable (LGDP1). The overall model is highly significant, as indicated by the low p-value for the F-test, and the R-squared value suggests a good fit of the model to the data.

Conclusion & Recommendation

Conclusion:

The econometric analysis reveals important insights into the factors influencing sustainable economic growth (SEG), proxied by the variable LGDP1. The regression results highlight the following key findings:

- 1. Corruption (COC):** An increase in the Corruption Index is associated with a significant positive impact on sustainable economic growth. This implies that efforts to reduce corruption could contribute to fostering a more conducive environment for economic development.
- 2. Carbon Dioxide Emissions (CO2):** The negative coefficient for CO2 suggests that higher levels of carbon dioxide emissions are associated with a decrease in sustainable economic growth. While the coefficient is statistically significant, the practical implications should be considered in the context of environmental policies and their potential economic repercussions.
- 3. Labour Force Participation (LF):** The negative coefficient for LF indicates that an increase in labor force participation is linked to a decrease in sustainable economic growth. This may suggest challenges related to job market absorption and the need for policies that enhance job quality and matching.
- 4. Foreign Direct Investment (FDI):** FDI emerges as a robust positive predictor of sustainable economic growth. The significant and positive coefficient suggests that attracting foreign direct investment can contribute significantly to economic development.

Overall Model Fit:

- The model's high R-squared value (0.773) indicates that a substantial proportion of the variation in LGDP1 is explained by the included variables.

- The F-test for the overall model is highly significant (p-value = 0.000), reinforcing the validity of the model.

Recommendations:

- 1. Anti-Corruption Measures:** Policymakers should focus on implementing and strengthening anti-corruption measures to improve institutional quality, fostering an environment conducive to sustainable economic growth.
- 2. Environmental Policies:** Consideration of policies aimed at reducing carbon emissions may be beneficial, not only for environmental sustainability but also for supporting economic growth. Balancing environmental conservation with economic development is essential.
- 3. Labor Market Policies:** Addressing challenges in the labor market, such as enhancing skills and improving job matching, can contribute to increased productivity and sustainable economic growth.
- 4. Promoting Foreign Direct Investment:** Policies that attract and facilitate foreign direct investment can play a pivotal role in stimulating economic growth. Governments should create an investor-friendly environment and address barriers to foreign investment.
- 5. Continuous Monitoring:** Regular monitoring and evaluation of these variables and their relationships are crucial. Policymakers should remain vigilant to changing dynamics and adjust strategies accordingly.

In conclusion, a comprehensive and balanced approach that addresses corruption, environmental concerns, labor market dynamics, and foreign direct investment is crucial for fostering sustainable economic growth. Policymakers should tailor strategies based on the specific circumstances of the

economy while ensuring a harmonious balance between economic development and other societal goals.

Bibliography

Alagidede, P., Adu, G., & Frimpong, P. B. (2015). *The Effect of Climate Change on Economic Growth*.

Springer Link.

Aldieri, L., & Vinci, C. P. (2018). *Green Economy and Sustainable Development*. MDPI.

Chiappero-Martinetti, E., Jacobi, N. v., & Signorelli, M. (2017). *Human Development and Economic Growth*.

Springer.

Duuren, T. v., Haan, J. d., & Kerkhoff, H. v. (2019). *Does Institutional Quality condition the impact of financial stability transparency on financial stability*. Taylor & Francis.

Fomba, B., Talla, D., & Ningaye, P. (10 January, 2022). *Institutional quality and Education Quality in Developing Countries*. Springer.

Hughes, D., Warhurst, C., & Duarte, M. E. (2021). *decent work, inclusion and sustainability*. Taylor & Francis.

Hussen, M. S. (2023). *Institutional Quality and Economic Growth in Sub Saharan Africa*. Emerald.

Khan, H., Khan, S., & Zuojun, F. (2020). *Institutional Quality and Financial Development*. Guangxi: Sage Pub.

Kreinin, H., & Aigner, E. (2021). *From Decent work and economic growth “to Sustainable work and economic De growth*. Springer.

- Liu, F., Chang-Richards, A., Wang, K. I.-K., & Dirks, K. N. (2023). *Effects of Climate Change on Health and Wellbeing*. Wiley.
- Siddiquee, M. N., Zahid, J. R., Sanjida, A., & Oshchepkova, P. (2022). *Sustainable economic growth and unemployment nexus of SDG 2030*. Springer.
- Tse, F. Y. (2022). *Learning about Pay at Work*. Leicester: Sage Pub.
- Xaisongkham, S., & Liu, X. (2022). *Institutional Quality, employment, FDI and Environmental Degradation in Developing Countries*. Zhengzhou: Emerald.
- Zhuang, J., Dios, E. d., & Lagman-Martin, A. (2010). *Governance and Institutional Quality and Links with Economic Growth and Income Inequality*. ADB.