MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 1, Jan-June 2026, Pages: 1198-1209

Natural Resources and Economic Growth Nexus in BIMSTEC Nations

Poonam[a], Vijender Pal Saini[b]
[a]Research Scholar, Haryana School of Business, Guru Jambheshwar University of Science and Technology, Hisar, Haryana, India. aryapoonam4008@gmail.com
[b]Assistant Professor, Haryana School of Business, Guru Jambheshwar University of Science and Technology, Hisar, Haryana, India. vijenderhsb@gmail.com

Abstract
The study inspects the dynamic linkage between natural resources and economic growth in BIMSTEC nations from 1991 to 2023. The study utilised the first- and second-generation unit root test to test the presence of a unit root in the series and the residual-based Panel Co-integration technique to test the dynamics of natural resources in BIMSTEC countries. The results are validated by the Panel-PMG co-integration technique. The results indicate that natural resources are co-integrated with economic growth in the long run and natural resources have a positive influence on growth. Further, gross capital formation and gross expenditure reveal a positive relationship with economic growth. The findings of this study are useful for policymakers associated with BIMSTEC nations. The results emphasize the need for policymakers to encourage the effective and productive consumption of natural resources as well as the expansion and production of renewable energy sources such as solar, wind, hydropower, and geothermal power.
Keywords- Natural Resources, Economic growth, BIMSTEC, Westerland Panel Co-integration Test, PMG Co-integration.

1. Introduction

Natural resources are among the various factors contributing to the economic growth of a country. Natural resources contribute to a country's overall real wealth. They serve as a raw material for other industries creating the wealth of the country. They support tax revenue, income, and poverty alleviation campaigns by creating employment opportunities (OECD, 2011; Topcu et al., 2020). According to neo-classical theories and Rawlsian economics, Natural resources are regarded as the 5th important factor of production after land, labor, foreign capital, and technology (Sadik-Zada, 2021 and Ravinder and Saini, 2022).
Natural resources represent the base of our living and the entire economic activity. Their depletion is a major challenge for the economic development of both developed and developing economies. Their efficient use is an indispensable requirement (Tahir and Hayat, 2022). Natural resources are critical for production processes, living, and social development (Bansal et al., 2021). They represent an essential part of the wealth of a country and should be managed sustainably to determine long-term economic development (Chopra et al., 2022). Natural resources play a significant role in driving economic growth in India. Access to and efficient utilization of natural resources like minerals, energy sources, and agricultural land contribute to industrial production, infrastructure development, and agricultural output. A well-managed and sustainable use of natural resources can boost overall economic growth.
The importance of nature for human existence or the survival of mankind has been duly noted by (Nathaniel & Bekun, 2020). However, over the past years, empirical studies that tested whether natural resources are a blessing or a curse to growth have found mixed results (Ding and Field 2005; Benramdane, 2017; Alexeev and Conrad 2009; Brunnschweiler and Bulte 2008; Oyinlola et al., 2015; Erdogan et al. (2020); Bildirici and Gokmenoglu (2020). Other researchers (Auty & Gelb, 2001; Campos & Nugent, 1999; Murshed, 2004) have also noted that a country's quality of institutions including its political regime will determine whether natural resources would be a blessing or a curse to its economic growth.
Many researchers argue that natural resources have an optimistic influence on the economic development of an economy as it induces more investment in economic infrastructure and helps to expand the development of human assets, thus playing an important role in generating foreign incomes through exports (Sachs & Warner, 1999; Adabor & Buabeng 2021), thus an important source of a nation's wealth (Topcu et.al., 2020; Hayat & Tahir (2020); James & Aadland, 2011). Hence from this perspective, for the development of the country, natural resources play an important role which provides needed foods, raw materials, and energy to the nation. The supporter of this view further argues that the purported "resource curse" can be converted into a prospect by creating and using high-quality institutions.
While the other school of thought indicates that the copiousness of natural resources is not always a benefit, and it might sometimes impede development and economic success (Daniele, 2011; Hayat & Tahir, 2020; Kwakwa, 2020; Ibrahiem & Sameh, 2021). Although developing nations are generally rich in resources, per capita income is approx. 6 times higher in developed nations (Global Resources Outlook, 2019; Sadik-Zada, 2021). This indicates the contentious nexus existing between natural resources, and growth; which signifies that countries with rich resources might not be having better economic advancement (Hayat & Tahir, 2020). Some studies have demonstrated that there is a negative relationship between economic growth and natural resource abundance (Sachs and Warner, 1995, 1997, 2001). This negative relationship is called the "resource curse" and has become a well-established finding. However, the data used in many studies is occasionally considered unreliable, and many relevant variables were unavailable, particularly in underdeveloped countries (Brunnschweiler and Bulte, 2008).
BIMSTEC was established on June 6, 1997, through the Bangkok Announcement that connects Southeast Asia with South Asia and includes seven member nations: Nepal, Bhutan, India, Sri Lanka, Bangladesh, Thailand, and Myanmar. The member countries of the BIMSTEC region share 22 % of the world's population, 2.7 trillion dollars in GDP, and a 6.5 percent GDP

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 1, Jan-June 2026, Pages: 1198-1209

growth rate. The BIMSTEC region has a wealth of plentiful natural resources, including gas and sea floor mineral reserves and oil resources (Powell, 2017). Further, the BIMSTEC region also has the biggest series of altitudes—from Mount Everest to the seafloor as a diverse spectrum of flora, fauna, minerals, temperatures, and other factors that serve as the foundation for various economic models. Nepal and Bhutan are the circumscribed hilly countries in the South Asian region (Xavier, 2018). India and Bangladesh have a lot of similar natural resources such as coal, oil, high-quality ore, and ferroalloys, etc.; the main natural resources of Nepal are hydroelectric power; Sri Lanka has limestone, graphite, a lot of successful plantations and other minerals; Myanmar is rich in metal ores, natural gas, precious stones, and petroleum products; Thailand is rich in forests, livestock, mining of natural gas, gold, rubber, etc.; the main natural resources in Bhutan are hydropower energy. The natural resource rent in the member nations of BIMSTEC is of varying nature. Natural resource rent in Bhutan is found highest at 7.57%, followed by India (3.00%), Myanmar (1.88%), Nepal (1.59%), Thailand (0.69%), Sri Lanka (0.54%), and Bangladesh 0.52% except Myanmar (5.57%) and Thailand (1.67%), rest of the BIMSTEC nations have shown declining natural resource rent from 1991 to 2019 (Table 1).

Table I. Variables

Variables	1991	2000	2008	2019	2020
Total natural resources rents (% of GDP)					
Bangladesh	0.529294	0.578192	1.10669	0.412652	0.318968
Bhutan	7.573537	3.991501	4.202361	2.179811	2.902466
India	3.003615	2.371834	7.103776	1.990921	1.936838
Myanmar	1.880203	0.16988	0.066987	5.574072	4.677223
Nepal	1.596161	1.16702	1.074374	0.442967	0.514043
Sri Lanka	0.541072	0.190956	0.168491	0.076329	0.089338
Thailand	0.692427	1.546131	3.716901	1.66765	1.300975
GDP growth (annual %)					
Bangladesh	3.485228	5.293295	6.01379	7.881915	3.448021
Bhutan	-0.40788	3.355068	4.799461	5.75517	-10.0763
India	1.056831	3.840991	3.086698	3.737919	-6.59608
Myanmar	1.059078	12.41819	11.07427	6.75046	3.173774
Nepal	6.36815	6.2	6.104639	6.657055	-2.36962
Sri Lanka	4.599987	6.000033	5.950088	2.32882	-3.61519
Thailand	8.55826	4.455247	1.725699	2.151656	-6.19549
GDP per capita (constant 2015 US$)					
Bangladesh	517.7637	653.8086	897.189	1581.568	1619.776
Bhutan	777.3242	1108.44	1909.246	3238.06	2879.639
India	527.5145	757.6687	1093.077	1965.539	1817.816
Myanmar	183.8163	309.9657	752.6491	1548.457	1586.902
Nepal	452.4033	561.0588	674.9538	1069.789	1025.509
Sri Lanka	1295.688	1923.413	2674.746	4228.149	4053.726
Thailand	2732.239	3517.799	4884.418	6612.227	6187.07

Source: WDI, 2022

Due to annual % GDP growth in Bangladesh, Bhutan, India, Myanmar, and Nepal from 1991 to 2019, the BIMTSEC nations have shown a twofold increase in GDP per capita. The highest is in Thailand (US$ 6187.07); followed by Sri Lanka (US$ 4053.73); Bhutan (US$ 2879.64); and India (US$ 1817.82) while the lowest is in Nepal (US$ 1025.51) (Table 1). Although the blowout of the COVID-19 health crisis at the end of 2019, led to a slowdown in the global economy and halted economic activities. The COVID-19 crisis harshly interrupted the global supply chains and reduced overall demand, badly affecting the growth of countries. The prices of natural resources are also badly affected.

The global oil prices witnessed a sharp decline with WTI Futures falling to their minimum in last four years, in May 2020 and due to this cause the market for natural resources has deteriorated due to the drop in oil prices, which is also affected the region's economic performance and slows down economic growth (Zhou et al., 2022). The member nations also witnessed negative economic growth in 2020. The economic growth of Bhutan declineda (-10.07%), followed by India (-6.59%); Thailand (-6.19%); Sri Lanka (-3.61%); Nepal (-2.36%). and Bangladesh from 7.88% in 2019 to 3.44% in 2020. The natural resource rent also decreased in the year 2020, due to the blowout of the COVID-19 pandemic (Table I).

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 1, Jan-June 2026, Pages: 1198-1209

In light of these circumstances, the current study seeks to examine the dynamic association between natural resources and the regional economic growth of BIMSTEC. The following are some ways that the present study adds to the prevalent literature: First off, although the relationship between natural resources and economic growth has been studied extensively in developed nations. Consequently, the primary driving force for the study is the dearth of research in the setting of developing nations, particularly in BIMSTEC nations. Secondly, to the best of our knowledge, no previous studies have examined the effect that natural resources have had on economic growth in recent decades using the most updated data. Thirdly, the BIMSTEC member nations have a wide range of undeveloped natural resources, making it relevant to test the causal association between natural resources and economic growth in BIMSTEC.

Thus, the present study intends to test the dynamic linkage between natural resources on economic growth in BIMSTEC nations. Thirdly, the blowout of COVID-19 has adverse repercussions on the prices of natural resources as well as on economic growth thus, the present study has considered the period of COVID-19 and considered the long-time frame 1981-2020, therefore the results of the study have wide implications for policymakers. Fourthly, the present study used panel co-integration analysis because panel data offers several advantages over cross-section and time-series estimation methods.

The remaining section of the study is arranged as: Section 2 reviews the extant literature. Section 3 consists of the data and the econometrical methods while the analytical results are given in Section 4 with the discussion with final observations in Section 5.

2. Literature Review

The nexus between natural resources and economic growth has been studied by numerous scholars. The potential association between growth and natural resources is a topic of great interest to both researchers and policymakers. Natural resource abundance creates opportunities for rent-seeking and patronage. Many researchers reported a positive association between natural resources and nations' growth as it is an integral and important factor for the economic development of a country. Natural resources are considered a key factor in production processes and they help to boost the development process (Hayat & Tahir, 2021). Adabor et al. (2021) tested the linkage between natural resources and economic advancement in Ghana from the period 2011-2020 by employing the ARDL model and discovered that an insignificant affirmative influence of oil rent (natural resources) has been found on the economy of Ghana. Adika (2021) examined the linkage between natural resources and FDI in SADC for the time 1990-2018 by employing various econometric techniques and concluded that economic advancement has been considerably obstructed by gross domestic savings, natural resources and human capital.

Aljarallah (2021) assessed the association between natural resources and the economic development of Saudi Arabia for the time frame 1984-2014 by employing the ARDL model. The study concluded that the total factor production and per capita GDP have increased with the increase in natural resource rents. Hayat (2016) examined the repercussions of natural resources on FDI and growth for the time 1996-2015 by employing the GMM estimation model and signified an optimistic and considerable nexus between external flows and the economic progress of the host country.

For the period January 1970- December 2017, by employing the ADF test, and VECM model, Mehar et al. (2018) pointed out the favorable repercussions of natural resources on India and Pakistan's economic progress. Tahir and Hayat (2020) examined the effect of foreign trade on development for the time frame 1989-2018 by using the ARDL model. They found that the positive influence of natural resources and domestic investment has been found in Brunei Darussalam. The repercussions of human capital have been found negative on economic advancement. Tahir et al. (2022) supported the notion for the time span 1989-2020 and explored the association between natural resources and economic advancement in Brunei Darussalam period 1989-2020 by employing various econometric techniques and the optimistic and considerable role of natural resources has been found. Zalle (2019) examined the repercussions of natural resources on economic advancement in Africa for the time span 2000-2015 by applying the ARDL model and by taking a sample of 29 countries and argued a long-run link among natural resources, GDP advancement, investments, and institutions.

Magdalena and Suhatman (2020) examined the repercussions of government expenditures, domestic investment, and overseas investment on Central Kalimantan's economic development for the time frame 1990-2019 by employing the multiple linear regression analysis. The study concluded that the repercussions of domestic and overseas investment on economic growth are optimistic. Due to problems with resource mismanagement, the Dutch disease phenomenon, rent-seeking behaviour, and the volatility of natural resource export prices, countries with an excess of natural resources may become victims of the resource curse. By employing the VAR model for the period 1971-95 in 80 countries, Choe (2003) observed a strong nexus between FDI and the growth of the selected countries. Lean and Tan (2011), by using the VECM model considering the period 1970-2009 found the optimistic long-run repercussions of FDI on economic growth. By employing the unit root testing approach and the Toda-Yamamoto model for the time frame 1976-2010, Ullah et al. (2014) found the long-run nexus among FDI, home investment and economic advancement. Bouchoucha and Bakari (2019), for the period 1976-2017, used the ARDL model and found adverse negative repercussions of FDI and internal investment on the economy of Tunisia.

Whereas, some researchers found the negative repercussions of natural resources on economic growth. Kwakwa (2020) tested the association between natural resources and the growth of Tunisia during 1970-2017 by employing regression analysis and the adverse repercussions of natural resources have been found due to the effective utilization of resources. Ibrahiem and Sameh (2021) shed light on the nexus between monetarist development, FDI, and Egypt's economic progress for the time span of

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 1, Jan-June 2026, Pages: 1198-1209

1971-2014 by employing the ARDL model. The study concluded that the adverse impact of natural resources in Egypt and the optimistic repercussions of the remaining selected variables on economic growth have been found. Hayat and Tahir (2020) shed some light on the association of FDI, natural resources, and economic growth for the period 1996-2016 by using the fixed effect threshold model and a considerable positive effect of FDI has been found and the export of natural resources has been found less than the statistically considerable estimated threshold.

3. Data and Research Methodology

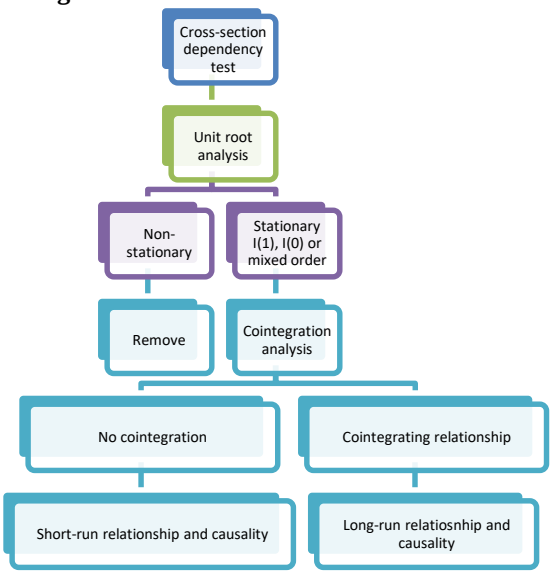
The annual data for the period 1981-2021 has been obtained from World Development Indicator for the countries Bangladesh, Bhutan, India, Nepal, Sri Lanka and Thailand to observe the dynamic linkage between natural resources and economic growth. Myanmar excluded in this study because of the non-availability of data. A concise portrayal of the variables considered in the study are Economic Growth (GDP), Natural Resources (NRR), Domestic Capital (GCF), Trade (TR), General Government Final Consumption Expenditure (GEXP) and Foreign Direct Investment (FDI) (Table 1).

Table II. Brief Description of Variables

Variables	Definition
Economic growth (GDP)	GDP growth
Natural Resources (NRR)	Total natural resources rents (% of GDP). The estimates of natural resources rents are calculated as the difference between the price of a commodity and the average cost of producing it. This is done by estimating the price of units of specific commodities and subtracting estimates of average unit costs of extraction or harvesting costs.
Gross Capital Formation (GCF)	Gross fixed capital formation as a percent of GDP
Trade (TR)	The sum of exports and imports of goods and services as a percent of GDP
General Government Final Consumption expenditure (GEXP)	General government final consumption expenditure (% of GDP)
Foreign Direct Investment (FDI)	Foreign direct Investment Inflows as a percent of GDP

Source: World Development Indicator

Figure I. Methodology flow diagram



Source: Author

Since cross-sectional dependency is a serious concern in panel data analysis, therefore, Pesaran Lagrange multiplier cross-section dependency test is applied, which is estimated as:

$$CD_{lm} = \sqrt{\frac{2}{N(N-1)}}_{i} \sum_{i=1} n-1 \sum_{J=i+1}^{N} \left(\frac{(T-K)\rho_{ij}^2 - u_{Tij}}{v_{Tij}^2} \right) \vec{d}(N,0) \quad (1)$$

Where k signifies the number of independent variables, u_{Tij} and v_{Tij}^2 are the first and second moments of $(T-K)\rho_{ij}^2$ correspondingly.

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 1, Jan-June 2026, Pages: 1198-1209

Since it is necessary to check the time-series properties of the variables before analyzing any inferential estimation. The panel unit root testing is done by employing the Levin-Lin-Chu (LLC) test, Im-Pesaran-Shin (IPS) test, Fisher-ADF test, Fisher-PP test, and Breitung test are performed to test the presence of unit root in the series. IPS test is calculated by taking the mean of the ADF t-statistics. The IPS unit roots test is calculated as:

$$y_{it} = \rho_i y_{i,t-1} + \sum_{i=1}^{p_i} \delta_{ij} \Delta y_{i,t-i} + z'_{it}\varphi + \varepsilon_{it} \quad (2)$$

where $z'_{it}$is the matrix of the non-random variables. The null is that all the panels are non-stationary, i.e., H_0: ρ=1, and the alternative of stationarity; H_1: $\rho < 1$ and is calculated as follow:

$$t_{IPS} = \frac{\sqrt{N}(t - \frac{1}{N}E[t_{iT}\rho_i = 1])}{\sqrt{\frac{1}{N}var[t_{iT}|\rho_i = 1]}} \quad (3)$$

However, the LLC tests are estimated as:

$$y_{it} = \rho_i y_{i,t-1} + z'_{it}\varphi + \epsilon_{it} \qquad i = 1,2,3,\ldots\ldots\ldots, N \text{ and } t = 1,2,3,\ldots\ldots, T \quad (4)$$

Further, cross-section dependence problems may arise due to unobserved heterogeneity. Although, the first-generation test does not consider individual heterogeneity into consideration, therefore, second generation panel unit root test, i.e., Pesaran's Cross-sectional ADF (CADF) is also applied. The researchers proceed further with the estimation of the co-integrating linkage between natural resources and economic growth utilizing several panel co-integration tests such as Pedroni, Kao co-integration and Johansen Fisher panel co-integration test. Pedroni test estimates seven several tests. Each has null of no co-integration with four of them belonging to the within dimensions, which are v-statistics, p statistics, PP-statistics, and ADF-statistics; three of them belonging to the between dimensions, which are group p-statistics, group PP-statistics and group ADF-statistics.
Westurland co-integration test allows for both endogenic variables and autocorrelation in co-moving series. The null is that all series are co-moving cross-sectionally against the alternative of no co-movement. In the last stage, we utilized the Panel ARDL model, proposed by Pesaran et al. (1999). The basic benefits of using PMG are that it generates short-run quantities and the error correction mechanism to be varying between countries, while the long-run quantities are identical across countries. The panel ARDL model is estimated as follows:

$y_{it} = \alpha_i + \varphi_i y_{it-1} + \beta_i x_{it} + u_{it}$, where i= 0, 1, 2, 3…… (3)

And the long-run parameter is ϑ_i, which is estimated as follows: $\vartheta_i = \frac{\beta_i}{1-\varphi_i}$. However, the short-run coefficients vary across countries because of different repercussions of the various global factors (Arya & Singh, 2021; Singh, 2022).

4. Results and Discussion

The descriptive analysis of each series in time-series (within), panel (overall), and cross-sectional (between) orders. The GDP in the BIMSTEC region varies from -8.74 to a maximum of 24.97, with an average of 4.04. Further, the volatility is higher in TR (31.89), followed by GCF (10.37), GEXP (4.82), and GDP (3.07). Although, the least volatility is observed in Natural resources (2.09). Further, skewness which is a measure of the asymmetry in the series is higher in NRR (2.55) and least in TR (0.68) while kurtosis which estimates the degree of flatness in the series is higher in GDP (13.78), followed by NRR (13.73) (Table III).

Table III. Preliminary analysis

Variable		Mean	Std. Dev.	Min	Max	Observations	Skewness	Kurtosis
GDPPC	overall	4.024	3.070	-8.742	24.974	N = 234	1.32	13.78
	between	0.910		2.958	5.591	n = 6		
	within	2.955		-8.792	23.407	T = 39		
NRR	overall	2.058	2.095	0.069	16.410	N = 234	2.55	13.73
	between	1.827		0.293	5.269	n = 6		
	within	1.264		-1.213	13.198	T = 39		
GCF	overall	29.953	10.337	15.473	69.485	N = 234	1.51	5.57
	between	8.285		22.660	46.084	n = 6		
	within	7.030		11.083	53.354	T = 39		
GEXP	overall	11.298	4.828	4.031	25.034	N = 234	0.73	2.98
	between	4.885		4.925	19.469	n = 6		
	within	1.827		4.982	18.579	T = 39		
TR	overall	59.215	31.896	12.219	140.437	N = 234	0.68	2.74
	between	29.418		29.747	99.501	n = 6		
	within	17.119		7.099	100.151	T = 39		

Source: Author

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 1, Jan-June 2026, Pages: 1198-1209

The IPS, LLC, and Breitung tests are utilized to observe the presence of unit root in the series. These are from first-generation tests and assume the cross-sectional independence between panel units and test the null of the existence of unit root. The outcomes show that the null hypothesis of non-stationarity is rejected for all the variables in levels except for trade which is stationary at a level while all the series are stationary at the first differences. Thus, all the variables are integrated in varied order, indicating the use of Panel-ARDL (Table IV).

Table IV. Unit root tests

First generation Unit root test						
At level						
	LLC		Breitung		IPS	
	z-value	p-value	z-value	p-value	z-value	p-value
NR	-6.6189	0.0000	-1.1539	0.1243	-4.7355	0.0000
FFDI	-1.8478	0.0323	-3.5459	0.0002	-1.0096	0.1563
GDPC	-4.5271	0.0000	-6.3776	0.0000	-6.3293	0.0000
GC	-2.5022	0.0062	-1.6146	0.0532	-1.0463	0.2333
GEX	-1.7604	0.0392	-2.1752	0.0148	-1.1179	0.1318
TRD	-1.4724	0.0705	-0.829	0.0002	-0.1146	0.4544
At 1st Difference						
	LLC		Breitung		IPS	LLC
	z-value	p-value	z-value	p-value	z-value	p-value
NR	-6.9214	0.0000	-4.0801	0.0000	-15.355	0.0000
FDI	-13.461	0.0000	-12.272	0.0000	-10.914	0.0000
GDPC	-10.3383	0.0000	-5.7617	0.0002	-11.604	0.0000
GC	-6.1237	0.0000	-10.836	0.0000	-9.5653	0.0000
GEX	-8.7732	0.0000	-7.9048	0.0000	-9.5383	0.0000
TRD	-6.254	0.0000	-8.3881	0.0000	-8.7083	0.0000

Source: Author

Likewise, since the BIMSTEC countries are more geographically connected as well as share similar kinds of cultural characteristics, suggesting the influence of cross-section correlation among the panels. Thus, a cross-section dependence test is applied and the results are signified. The outcomes suggest that the variables, i.e., NRR, GDPPC, GCF, GEXP, TR, are exhibiting evidence of commonality (Table V).

Table V. Cross-section dependency test

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	43.1103	15	0.0002
Pesaran scaled LM	5.13222		0
Pesaran CD	5.70462		0

Source: Author

Considering the presence of cross-sectional dependence in the series, a next-generation panel unit root test, i.e., Augmented cross-sectional ADF (CADF) is applied. The findings of the CADF test also provide robust results and establish a mixed order of integration, confirming the outcomes of first-generation unit root tests. GDP, TRD, and FDIN are found stationary at the level, whereas NRR, GC, and GEXP are found non-stationary at the level but become stationary after first differencing (Table VI).

Table VI. Second-Generation Panel Unit Root Tests

Second-Generation Unit Root Test				
CADF test				
Variable	Level	p-value	First Difference	p-value
NRR	-1.561	0.059	-9.308	0.000
GDP	-4.414	0.000	-10.808	0.000
GC	-0.864	0.194	-5.712	0.000
GEXP	0.542	0.294	-6.957	0.000
TRD	0.217	0.000	-7.895	0.000
FDIN	-3.482	0.000	-8.613	0.000

Source: Author

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 1, Jan-June 2026, Pages: 1198-1209

Establishing the mixed order of integration in the variables, our study proceeded with the estimation of panel co-integration using Pedroni, Kao, and Fisher-ADF panel co-integration tests. The outcomes confirm a long-run association among natural resources, gross capital formation, government expenditure, and economic growth. After confirming the long-run association, we can proceed to estimate long-and short-run dynamics.

Table VII. Panel Co-integration test

Panel A: Pedroni Co- integration		
Common AR coefficients (Within dimensions)		
Panel v-Statistic (Weighted)	-0.24163	0.5955
Panel rho-Statistic (Weighted)	-2.74281	0.003
Panel PP-Statistic (Weighted)	-9.28842	0
Panel ADF-Statistic (Weighted)	-4.85406	0
Panel v-Statistic	0.296163	0.3836
Panel rho-Statistic	-4.09073	0
Panel PP-Statistic	-9.89781	0
Panel ADF-Statistic	-5.07029	0
Group rho-Statistic	-2.59117	0.0048
Group PP-Statistic	-13.3422	0
Group ADF-Statistic	-6.16072	0
Panel B: Kao estimation		
ADF	-3.22631	0.0006
Panel C: Johansen Fisher Panel Co-integration Test		
Fisher Stat.* (None)	94.83	0
At most 1	50.9	0
At most 2	21.62	0.042

Source: Author

Further, the study also performed the Westurland–Durbin–Hausman panel cointegration test. This test generates two statistics: Group statistics considering the cross-sectional to be identical and Panel statistics considering the cross-sectional heterogeneity. The results specify that the null of no co-movement is rejected at the conventional level, confirming that the NRR, GDPPC, GCF, GEXP, and TR are co-integrated in the long run (Table VII).

Table VIII. Results of Westurland-Durbin-Hausman (2008) co-integration test

Panel-specific	**Statistics**	**p-value**
Model 1	-2.0305	0.0212
Model 2	1.7395	0.041

Source: Author

The Hausman test indicated that the PMG estimator is the most efficient. The MG estimator can estimate long-run and short-run coefficients for each country while the DFE estimator can only estimate overall short-run and long-run coefficients. The Hausman test is conducted to check whether the Pooled Mean Group method or the Mean Group method should be applied. The null hypothesis of the Hausman test is not rejected as the calculated value is 0.9999 which indicates that the PMG estimator is the most efficient.

Similarly, the suitability of the Pooled Mean Group estimation method or Dynamic and Fixed Estimation method is also tested by employing the Hausman test. The null hypothesis of the Hausman test is also not rejected as the calculated value is -3.42 which also indicates that the PMG estimator is efficient.

The Outcomes of the Pooled Mean Group reveal that the effect of domestic capital (GC) is found positive and significant on economic growth in the long run. Whereas the effect of natural resources (NRR), government expenditure (GEX), foreign direct investment (FDIN), and trade (TRD) is found insignificant on economic growth in the long run. The effect of natural resources and government expenditure is found negative.

Similarly, the short-run results of the PMG estimation method reveal that the effect of natural resources on economic growth is found negative and significant at a 10% significance level suggesting that natural resources negatively influence growth in the short run in the BIMSTEC countries. Domestic capital has also a positive and significant effect on economic growth in the

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 1, Jan-June 2026, Pages: 1198-1209

long run. This suggests that GCF positively influences economic growth in BIMSTEC countries. The effect of government expenditure, trade, and foreign direct investment is found negative but insignificant in the short run. The ECT is negative and significant, which further confirms the co-integrating relationship between natural resources, GCF, GEXP, and TR in the region (Table IX).

Table IX. Estimates of Panel Error-Correction Model with PMG method

PMG Method			**Mean Group Estimation**		**DFE Estimation**	
D.GDPG	**Coeff.**	**P-value**	**Coeff.**	**P-value**	**Coeff.**	**P-value**
Long-Run Results						
NRR	-0.16582	0.907	2.527729	0.089	-1.38186	0.781
GC	0.239243	0.044	-0.04885	0.925	-0.50207	0.617
GEX	-0.54276	0.22	-4.63665	0.232	-0.50664	0.836
FDIN	0.288175	0.317	3.813568	0.267	0.040245	0.955
TRD	0.01962	0.636	-0.02485	0.847	0.002297	0.993
Short-Run Results						
ECT	-0.0518	0.696	-0.07366	0.641	-0.07887	0.45
NRR	-1.73144	0.069	-0.72969	0.478	-0.84768	0.124
GC	0.344702	0.006	0.34386	0.017	0.075239	0.291
GEX	-0.90095	0.172	-1.17044	0.22	-0.7688	0.005
FDIN	-8.1E-05	0.999	0.031424	0.953	0.003786	0.971
TRD	-0.20435	0.764	-0.00833	0.898	0.02609	0.619
_cons	0.13775	0.769	2.072822	0.716	2.265248	0.405

Source: Author

The outcomes of the study are similar to Choe (2003); Adabor & Buabeng (2021); Magdalena & Suhatman (2020) and Alijarallah (2021) who reported an optimistic effect of oil resources on Ghana's economic growth. Ibrahiem and Sameh (2021) also found an optimistic influence of natural resources on economic growth. They contended that natural resources are inherent sources and thus exploration of these resources leads to the development of the country. Adika (2021) further explained that the effective utilization of natural resources can turn economies to a greater level of development. Alijarallah (2021) and Mehar et al. (2018) emphasized the sustainable usage of resources as well as sustainable economic advancement and development. They further argued that the focus should also be on enhancing the quality of human capital. Tahir and Hayat (2020) and Tahir et.al. (2021) observed that countries that are rich in resources are commonly found facing a high degree of external negative demand shocks which leads to outside economic recessions. Thus government can play an important role in developing the infrastructure necessary to exploit the resources for the progress of a country. Hassan et.al. (2019) argued that the ecological footprints have been positively affected by natural resources in Pakistan.

Although, our results stand in sharp contrast with Kwakwa (2020); Ullah et al. (2014) who argued that the negative influence of natural resources is due to ineffective utilization of resources. Hayat and Tahir (2020) argued that the volatility of natural resources can also lead to an adverse association between economic growth and natural resources. Our results regarding the positive effects of capital formation on economic growth are similar to Lean and Tan (2011) and Bhujabal and Sethi (2019) who found the positive long-run effect of FDI on economic growth and the negative influence of domestic investment on economic growth in Malaysia. Ullah et.al. (2014) found a long-run relationship between FDI, national investment, and economic progress. Bouchoucha and Bakari (2019) also illustrated the adverse consequences of FDI and GCF on the economic progress of Tunisia.

5. Conclusion

The main aim of this study is to test the influence of natural resources on economic growth in the BIMSTEC nations for the period 1981 to 2023, utilizing the technique of panel ARDL. The findings of Kao and Pedroni's co-integration reveal that a long-run co-integration has been found between selected variables. Further, robust results are given by the Westerland co-integration test. The results of PMG-ARDL reveal that in the long run, the impact of natural resources on economic growth is found positive while negative in the short run. Further, the impact of domestic capital is positive and substantial while trade has a negative but insignificant influence in the BIMSTEC region.

According to the results of PMG-ARDL, the repercussions of natural resources is positive on economic growth in the long run while it is negative in the short run. Further, repercussions of the Gross Capital formation are positive and considerable on economic growth while trade negatively and inconsiderably influences economic growth in the BIMSTEC region. On the other

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 1, Jan-June 2026, Pages: 1198-1209

hand, in the short run natural resources, GEXP, and Trade coefficients have a negative and inconsiderable relationship with economic growth, although the repercussions of GCF are positive. The long-run impact of natural resources confirms the neo-classical thoughts which state that natural resources are one of the key determinants of the growth of an economy. While, in the short-run, the effect of natural resources has been found adverse, it signifies the inefficient and unproductive utilization of natural resources.

These findings emphasize the need for policymakers in the BIMSTEC region to encourage efficient and productive utilization and enhance the usage of renewable energy sources such as solar, wind, hydro, and geothermal energy. These energy sources are considered to be more environmentally friendly and sustainable as well as exert low emissions. It's important to note that while natural resources can have positive impacts on the economy, their sustainable management, conservation, and responsible use are crucial for long-term economic development and environmental sustainability. Balancing the exploitation of resources with environmental concerns and investing in alternative sources of growth can lead to a more resilient and sustainable economy.

The authors recommend policymakers keep in mind the following points while formulating policies for natural resources.

1. BIMSTEC is a regional group consisting of seven nations having a secretariat in Dhaka, Bangladesh. BIMSTEC nations require a cooperative approach to increase the efficient and eco-friendly utilization of natural resources. It will not only strengthen but also contribute to the economic development of the region in the long run.
2. BIMSTEC nations should create a common comprehensive database of natural resources and establish a fast mechanism for data sharing. Natural resources positively affect economic growth, so decision-making based on pooled data will facilitate informed decision-making and will be helpful for enhancing domestic production. It will lead to sustainable resource management in the long run. So, the authorities are suggested to take appropriate policy measures to increase the efficient and eco-friendly utilization of natural resources.
3. The group should focus on the development of renewable energy resources like solar, wind, hydropower, and geothermal power so that dependency on fossil fuels could be reduced.
4. The BIMSTEC nations should focus on the adoption of green technologies and invest in research in similar areas so as to address the challenges related to nations' resources.
5. BIMSTEC nations should understand the spirit of cooperation and think about mutual benefits and sustainable development in the area of natural resources for the overall growth of economies in the region.

References

Adabor, O., & Buabeng, E. (2021). Empirical Analysis Of The Causal Relationship Between Gas Resource Rent And Economic Growth: Evidence from Ghana. *Available at SSRN 3874481*.

Adika, G. (2021). Regional Economic Integration, Natural Resources And Foreign Direct Investment In SADC. *Journal of Economics and Development*.

Aljarallah, R. A. (2021). An Assessment of The Economic Impact Of Natural Resource Rents In Kingdom Of Saudi Arabia. *Resources Policy*, *72*, 102070. https://doi.org/10.1016/j.resourpol.2021.102070

Arya, V., & Singh, S. (2021). Revisiting the Nexus between External Debt and Economic Growth in the SAARC Countries: A Panel ARDL Approach. *Available at SSRN 3993122*.

Bhujabal, P., & Sethi, N. (2020). Foreign direct investment, information and communication technology, trade, and economic growth in the South Asian Association for Regional Cooperation countries: An empirical insight. *Journal of Public Affairs*, *20*(1), e2010.

Bouchoucha, N., & Bakari, S. (2019). The Impact of Domestic and Foreign Direct Investment on Economic Growth: Fresh Evidence from Tunisia. https://mpra.ub.uni-muenchen.de/94777/

Choe, J. I. (2003). Do foreign direct investment and gross domestic investment promote economic growth?. *Review of development economics*, *7*(1), 44-57.

Daniele, V. (2011). Natural Resources And The 'Quality' of Economic Development. *the Journal of Development studies*, *47*(4), 545-573.

Hassan, S. T., Xia, E., Khan, N. H., & Shah, S. M. A. (2019). Economic Growth, Natural Resources, And Ecological Footprints: Evidence from Pakistan. *Environmental Science and Pollution Research*, *26*(3), 2929-2938.

Hayat, A., & Tahir, M. (2020). Foreign Direct Investment, Natural Resources And Economic Growth: A Threshold Model Approach. *Journal of Economic Studies*. https://www.emerald.com/insight/0144-3585.html.

Hayat, A. (2016). Foreign Direct Investment, Institutional Framework And Economic Growth. (1-26)

Ibrahiem, D. M., & Sameh, R. (2021). Financial Development and Natural Resources Nexus In Egypt: The Role Of Clean Energy Sources And Foreign Direct Investment. *International Journal of Energy Sector Management*. https://www.emerald.com/insight/1750-6220.html.

James, A., & Aadland, D. (2011). The Curse of natural resources: An empirical investigation of US counties. *Resource and Energy Economics*, *33*(2), 440-453.

Kwakwa, P. A. (2020). What determines renewable energy consumption? Startling evidence from Ghana. *International Journal of Energy Sector Management*. https://www.emerald.com/insight/1750-6220.html.

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 1, Jan-June 2026, Pages: 1198-1209

Lean, H. H., & Tan, B. W. (2011). Linkages between Foreign Direct Investment, Domestic Investment and Economic Growth in Malaysia. *Journal of Economic Cooperation & Development*, *32*(4). 2011, 75-96.

Magdalena, S., & Suhatman, R. (2020). The Effect of Government Expenditures, Domestic Investment, Foreign Investment to the Economic Growth of Primary Sector in Central Kalimantan. *Budapest International Research and Critics Institute-Journal (BIRCI-Journal)*, *3*(3), 1692-1703.

Mehar, M. R., Hasan, A., Sheikh, M. A., & Adeeb, B. (2018). Total natural resources rent relation with economic growth: the case of Pakistan and India. *European Journal of Economic and Business (ISSN-2456-3900)*, *3*(03).

Makki, S. S., & Somwaru, A. (2004). Impact of foreign direct investment and trade on economic growth: Evidence from developing countries. *American Journal of Agricultural Economics*, *86*(3), 795-801.

OECD. (2011). The Economic Significance Of Natural Resources: Key Points For Reformers In Eastern Europe, Caucasus And Central Asia. https://www.oecd-ilibrary.org/trade/open-markets-matter_9789264162938-en. [accessed from 10 June, 2022)

Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled Mean Group Estimation Of Dynamic Heterogeneous Panels. *Journal of the American Statistical Association*, *94*(446), 621-634.

Powell, L. (2017). Energy Cooperation Under BIMSTEC: Are Techno-Economic Rationales Sufficient?. *ORF, https://www. orfonline. org/research/energy-cooperation-bimstectechno-economic-rationales-sufficient*. ISBN 978-93-87407-04-6

Saini, V. P., & Ravinder. (2022). Lead-lag association between foreign flows and economic growth in selected emerging economies. *International Journal of Indian Culture and Business Management*, *27*(1), 125-138.

Saini, V. P. (2022). Trade Flow among Association of South-East Asian Nations (ASEAN) Countries: A Trade Intensity Approach. *SDMIMD Journal of Management*, *13*(2).

Saini, V. P. (2022). RELATIONSHIP BETWEEN OUTWARD FDI AND HOME COUNTRY EXPORTS: AN EMPIRICAL STUDY OF BANGLADESH. *Journal of Developing Economies (JDE)*, *7*(2).

Ravinder, Poonam, & Pal Saini, V. (2022). FOREIGN INFLOWS, TRADE AND ECONOMIC GROWTH: EVIDENCE FROM A NEWLY INDUSTRIALIZED COUNTRY. *International Journal of Engineering Technologies and Management Research*, *9*(2), 15-26.

Ravinder, Poonam, & Saini, V. P. (2022). Trade Flow among Association of South-East Asian Nations (ASEAN) Countries: A Trade Intensity Approach. *SDMIMD Journal of Management*, 13(2), 51–62. https://doi.org/10.18311/sdmimd/2022/30720

Sachs, J. D., & Warner, A. M. (1999). The Big Push, Natural Resource Booms And Growth. *Journal of Development Economics*, *59*(1), 43-76.

Sadik-Zada, E. R. (2021). Natural Resources, Technological Progress, And Economic Modernization. *Review of Development Economics*, *25*(1), 381-404.

Singh, S. (2022). Effect of Financial Development and Foreign Direct Investments on Economic Growth in SAARC Countries: A Panel ARDL Approach. *Asian Journal of Management Studies*, *2*(1). http://doi.org/10.4038/ajms.v2i1.44

Tahir, M., Burki, U., & Hayat, A. (2022). Natural Resources And Economic Growth: Evidence From Brunei Darussalam. *International Journal of Emerging Markets*.

Topcu, E., Altinoz, B., & Aslan, A. (2020). Global Evidence From The Link Between Economic Growth, Natural Resources, Energy Consumption, And Gross Capital Formation. *Resources Policy*, *66*, 101622.

Ullah, I., Shah, M., & Khan, F. U. (2014). Domestic Investment, Foreign Direct Investment, And Economic Growth Nexus: A Case Of Pakistan. *Economics Research International*, *2014*.

Xavier, C. (2018). *Bridging the Bay of Bengal: Toward a stronger BIMSTEC*. New Delhi and Washington: Carnegie Endowment for International Peace. Vol. 5.

Zallé, O. (2019). Natural resources and economic growth in Africa: The role of institutional quality and human capital. *Resources Policy*, *62*, 616-624.

Zhou, H., Li, D., Mustafa, F., & Altuntaş, M. (2022). Natural resources volatility and South Asian economies: Evaluating the role of COVID-19. *Resources Policy*, Vol. 75, 102524.