Depletion of Natural Resources and Its Impact on Pakistan Economy

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Abstract

Depletion of natural resources is a major obstacle to sustainable economic development, particularly in resource-deficient developing economies like Pakistan. In this research, the authors discuss the scale, causes, and economic consequences of natural resource depletion in Pakistan, particularly in the agriculture and industry sectors. We used a mixed-methods design to analyze a time-series dataset spanning 1998 to 2021. Three major hypotheses were evaluated: (i) the resource-economy nexus, (ii) demographic pressures, and (iii) institution effectiveness. Descriptive and trend analyses reveal significant declines in per capita water availability and increased volatility in sectoral GDP. According to econometric estimates, the positive and significant relationship between water availability and the agricultural share of GDP was observed, and the negative link between natural gas supply and the industrial share of GDP was found. Population growth negatively affects GDP growth and job opportunities. A negative association was identified between water scarcity and GDP growth. The empirical findings support all hypotheses; specifically, population growth and urbanization have a significant negative impact on growth. The study therefore proposes that policymakers focus on integrated resource management, investment in green technologies, environmental governance, and strategic demographic planning.

Keywords: Natural Resource Depletion, Environmental Degradation, Sustainable Development, Water Scarcity, Sectoral Impact.

Introduction

Natural resources are the backbone of economic development, providing the key inputs for agriculture, industry, and energy production. However, industrialization, population growth, and consumption trends have led to the unsustainable exploitation of natural resources, resulting in their rapid depletion and endangering the global economy (Batool & Amjad, 2022; De Blasio, 2024). Such an issue is more serious in developing countries like Pakistan, where institutional capacity is lacking to address it sustainably.

Pakistan has a varied but limited natural resource base, comprising arable land cultivated by one of the world's largest irrigation systems, mineral resources (such as Thar coal), and forests. Traditionally, these resources support the agrarian economy and the emerging industrial sector (Dai & Du, 2023; Shemer et al., 2023). Nevertheless, the decades of poor governance, along with high population growth and climatic stresses, have deepened the crisis of depletion. The water

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table is dropping at an alarming rate, forest cover is being significantly reduced, soil fertility is being undermined, and fossil fuel reserves are being depleted faster than they can be replenished (Abid & Aziz, 2025; Ullah & Lin, 2024). The effects spread throughout the economy: agricultural performance declines amid water shortages; the industrial sector faces an energy deficit; environmental decline leads to significant health issues and high adaptation costs. Despite significant research on these issues, there is a critical gap: the available academic literature often examines environmental degradation or economic performance in isolation, or dwells on globalization without analyzing the contextual issues of nations like Pakistan in detail, at both the national and sectoral levels. Integrated studies that measure the effects of multi-resource depletion, institutional failures, and policy failures reveal significant knowledge gaps. The present study intends to fill this gap. Hence, the primary objectives of this study are:

1. To assess the present scale of natural resource depletion and its impact on various sectors of Pakistan's economy.
2. To investigate the role of population growth, urbanization, and irrigation water availability in agricultural output, unemployment level, and sectoral growth in Pakistan.
3. To evaluate the role of institutional and legal frameworks in the management of resources.

To explore these objectives, this study aims to address the following research questions:

RQ1: How does the depletion of natural resources influence core economic sectors and the unemployment level in Pakistan?

RQ2: What is the role of water scarcity and population growth in agriculture and industrial output?

RQ3: What is the contribution of institutions and the legal framework in the management of resources?

The research is guided by three central hypotheses:

H1: Natural resources depletion negatively correlates with agricultural and industrial output in Pakistan.

H2: Population growth and urbanization negatively correlate with natural resources.

H3: Existing institutional and legal frameworks in Pakistan are ineffective in mitigating resource

By employing a mixed-methods research design, this paper provides a holistic analysis. The subsequent sections present a literature review, outline the methodology, detail the empirical findings, discuss their implications, and conclude with evidence-based policy recommendations for sustainable resource management in Pakistan.

Literature Review

The term natural resource depletion refers to the depletion of renewable and non-renewable resources at a rate exceeding their rates of renewal or replenishment. Historically viewed as inexhaustible, the exhaustibility of natural resources became evident in the twentieth century, alongside rapid industrial growth (Basavapattan, 2021). Rangkuty and Ferine. (2024). Ameer and Ahmad (2024). Malthus' theory identified a negative relationship between population growth and food output due to the inelasticity of cultivable land. The historic Brundtland Report (1987) later proposed the concept of sustainable development, focusing on the inter-generational distribution of natural resources and integrating the environmental aspects with economic growth (Hajian & Kashani, 2021). The resource curse, ecological economics, and natural-capital accounting are also ideas that have continued to evolve to explain why having resources does not always lead to development and to value ecosystems (Barbier, 2021; Spash, 2020; Ali et al., 2021).

Resource depletion is a key issue worldwide and manifests in various forms of crises, such as energy deficits, water scarcity, deforestation, and soil degradation, among others, with significant economic implications. Empirical research shows that depletion disrupts supply chain connections, increases production costs, exacerbates geopolitical extrapolation, and increases climate vulnerability (Huo & Peng, 2023; Bordoff & O'Sullivan, 2023; Anderson, 2024). Sub-Saharan African and Southeast Asian studies associate deforestation and soil erosion with reduced agricultural output and high poverty in rural areas (Miyamoto, 2020; Belete & Yadete, 2023). The resource curse literature highlights the paradox of economically unstable, weak institutions in countries with large amounts of mineral wealth, including Nigeria and Venezuela, due to over-dependence on mineral wealth and a lack of resource management practices (Miscevic, 2021).

In Pakistan, empirical studies have found that there are various pressing environmental and economic issues. Various sources indicate that the Indus Basin aquifer is rapidly disappearing, and per capita water availability has already reached the water-scarcity threshold, posing an immediate threat to the irrigation system (Ahmad et al., 2023; Sheikh et al., 2021; Yang & Solangi, 2024). Waterlogging and the conversion of forest areas have led to deforestation of less than 5 per cent of total forest areas, increasing exposure to floods and landslides (EPA, 2017). The overreliance of the energy sector on dwindling domestic natural gas and oil reserves has led to frequent power shortages and a plunge in industrial production (Peng et al., 2024; Siyal et al., 2023). Furthermore, due to pollution and excessive resource exploitation, environmental degradation is associated with high health costs and reduced labor productivity (Rafique & Rehman, 2020; Onanuga et al., 2022). Although a constitutional basis for a healthy environment exists, and policies such as the National Water Policy (2018) and the Climate Change Act (2017) have been developed, they have not been implemented in spirit and letter (Yasin et al., 2021; Fida et al., 2023). Ishaque et al., 2023; Shabbir et al., 2020. Among the major challenges are a lack of coordination between the federal and Provincial governments after the 18th Amendment, the inability to enforce environmental protection institutions, outdated laws, and a clash of economic priorities (Dkhili et al., 2020). It is an institutional failure that is cited as one of the main causes of unsustainable development.

Despite the substantive views presented in the mentioned literature, it is mostly focused on single resources or fields. The study in question overcomes this weakness by providing a combined econometric analysis that matches various resource depletion metrics, such as water, forests, land, and energy, at the macro-level and sectoral economic outputs in Pakistan. The research also makes a distinctive contribution by combining quantitative models with qualitative evaluation of the depletion of natural resources, and by providing a comprehensive view of the factors responsible for this depletion and their effects on sectoral growth in Pakistan.

Research Methodology

Research Design

In the current study, a mixed-methods research design is employed because this is a quantitative study based on time series data spanning from 1998 to 2021 (N-24) and sourced from the World Bank's World Development Indicators, Pakistan Bureau of Statistics, Pakistan Economic Survey, Pakistan Energy Yearbook, Ministry of Agriculture, and the State Bank of Pakistan. The qualitative analysis includes a documentary examination of the policy framework and institutional reporting to contextualize the quantitative responses and assess the effectiveness of governance. By triangulating these methods, one can increase the validity and depth of analysis.

Variables and their measurements

The study's variables, such as GDP, which is measured in (current US$), Agriculture output is measured as % of GDP, Industrial output is measured as % of GDP, Population growth is measured

in percentage annual increase in total population, Unemployment rate is measured by dividing the employed active labor force by the total number of labor force (%). Water scarcity level is measured by water availability per capita (Water_pc, m³/person). The share of natural gas in electricity generation (GasShare, %) is measured by the ratio of gas in total energy production. The share of gas in electricity generation and the scaling down of water levels are proxied for the depletion of natural resources. The key variables selected for analysis include:
Dependent Variables: `ln GDP` (natural log of GDP), `Agriculture`, `Industry`.
Independent Variables: Waterpc`, `Gas Share`, `lnPop` (log of population), `Unemployment`.

Analytical framework and specification of models
The analysis was carried out in four stages, and three models were constructed to conduct sectoral analysis:

1. Descriptive and trend analysis were conducted to understand data characteristics and longitudinal patterns.
2. Correlation Analysis was used to determine bivariate relationships between variables.
3. Regression Analysis was used to identify causal relationships among variables. Three key econometric models were specified for the current study:

Model 1: (Agriculture): `Agriculture = $\beta_0 + \beta_1$(Water_pc) + $\varepsilon$`
Model 2 (Industry): `Industry = $\beta_0 + \beta_1$(GasShare) + $\varepsilon$`
Model 3 (Macro GDP): `lnGDP = $\beta_0 + \beta_1$(lnPop) + $\beta_2$(Unemployment) + $\varepsilon$`
Various diagnostic tests such as Durbin-Watson for autocorrelation, residual plots for homoscedasticity, VIF/Tolerance for multicollinearity) were conducted to check model robustness.

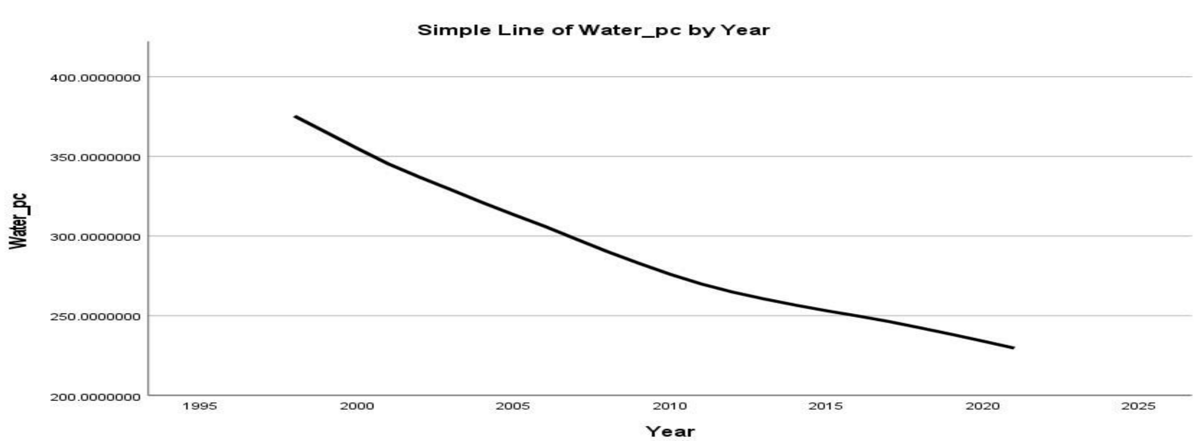
4. Qualitative Policy Analysis was conducted to review key environmental policies, laws, and institutional reports to understand the level of governance.

Results

Trend analysis

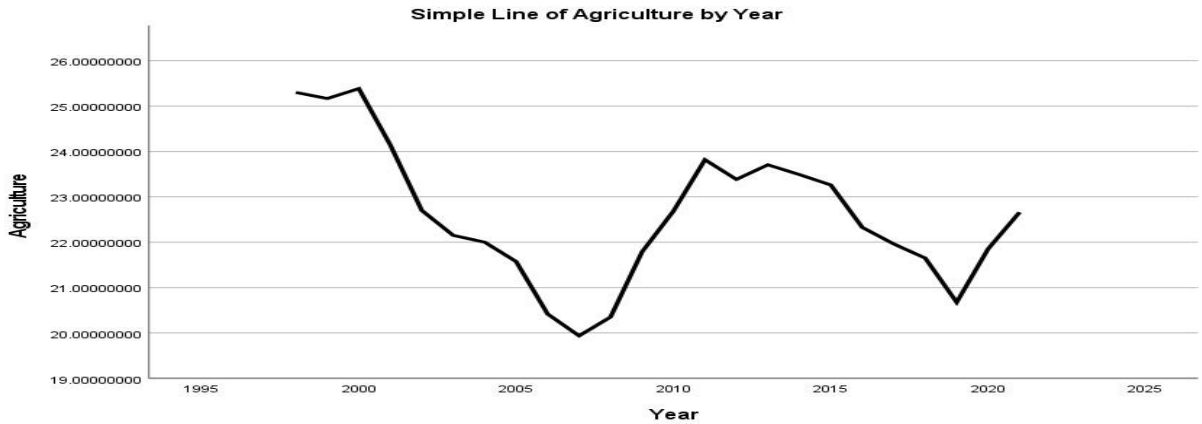
We used trend analysis to identify changes among variables during the study period. The results of the analysis are highlighted in the following Figures.
The rapid decline of water per capita is shown in Figure 1**.**

Figure 1: Water per capita availability shows alarming decline from 375 m³ to 229 m³



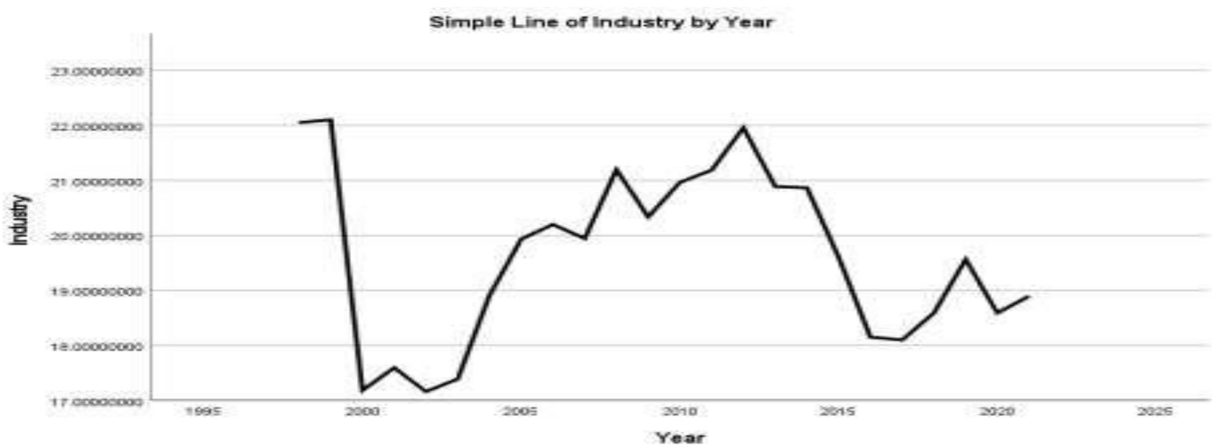
The per capita water availability was decline significantly during 1995 and 2022, which is alarming and it is one of the main causes of agriculture output decline over the years.
The downward trajectory of agriculture share in GDP is shown in Figure 2.

Figure 2: Agriculture Share Trend: Displays a downward but fluctuating trajectory, indicating structural shift and vulnerability to resource shocks



The share of agriculture sector in Pakistan's GDP was more than 25% in 1995, which has dropped to 22.7 percent in 2022. This indicates shifting resources from agriculture to industrial and service sectors. Industry share in GDP is shown in Figure 3 below:

Figure 3: Industry Share Trend: Exhibits high volatility, with sharp dips corresponding to periods of political and energy instability.



The share of industrial sector declined from 22% in 1995 to 19% in 2022, highlighting withdrawal of investment from this sector due to energy shortage, high taxation and high cost of doing business in Pakistan. This is alarming condition because manufacturing section is considered as engine of growth, main source of the supply of goods and services and providers of employment to jobless workers.

Figure 4: Trend of nominal GDP growth over the years

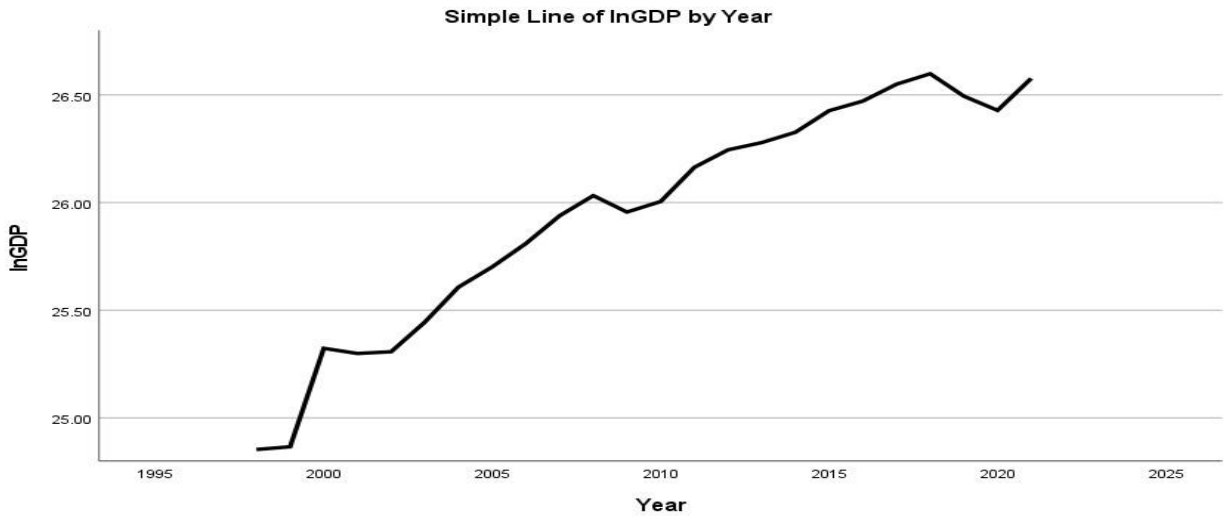


Figure 4 depicts a steady upward climb, smoothing the exponential growth of the nominal GDP, demonstrating high inflationary pressure in the economy where prices are rising without matching quantity of goods and services. As we have seen, the share of industry and agriculture production fell during 1995-2022 and the result is that money is chasing goods, which are becoming scarce.

Descriptive Statistics

Table 1 summarizes the data which show substantial GDP growth from $62.2 billion to $356.1 billion, with high variability (SD ≈ $95.4bn). Agriculture's share in GDP averaged 22.6%, showing a gradual declining trend, while Industry averaged 19.64% with notable volatility. The most critical finding is the drastic fall in per capita water availability, from 375 m^3 to 229 m^3, crossing the absolute scarcity threshold (<500 m^3). Population grew relentlessly from 146 million in 1995 to 239 million in 2022. Unemployment averaged 1.97% but with high fluctuation, and gas share in electricity fluctuated around average 34.2%.

Table 1: Descriptive Statistics Variables (1998–2021)

Variable	N	Minimum	Maximum	Mean	Standard Deviation
Gross Domestic Product (US$)	24	6.22E10	3.56E11	2.10E11	9.54E10
Agriculture (% of GDP)	24	19.94	25.39	22.60	1.52
Industry (% of GDP)	24	17.16	22.10	19.64	1.58
Water per Capita (m^3)	24	229.67	375.37	289.21	44.56
Population	24	1.47E8	2.39E8	1.94E8	2.87E7
Unemployment Rate (%)	24	0.398	6.338	1.971	1.905
Gas Share (%)	24	25.63	50.77	34.21	6.74
ln (GDP)	24	24.85	26.60	25.95	0.54
ln (Population)	24	18.80	19.29	19.07	0.15

Source: Authors own calculations based on secondary data (1998–2021).

Correlation Analysis

The correlation matrix in Table 2 demonstrate correlation among economic, demographic, and natural resource variables for Pakistan (1998–2021).

Table 2: Outcomes of Correlation Analysis

		lnGDP	Agriculture	Industry	Water_pc	lnPop	Unemployment	GasShare
lnGDP	Pearson Correlation	1	-.463*	-.048	-.987**	.981**	.712**	-.108
	Sig. (2-tailed)		.023	.824	.000	.000	.000	.617
	N	24	24	24	24	24	24	24
Agriculture	Pearson Correlation	-.463*	1	.130	.431*	-.401	-.114	-.413*
	Sig. (2-tailed)	.023		.545	.036	.052	.596	.045
	N	24	24	24	24	24	24	24
Industry	Pearson Correlation	-.048	.130	1	.003	-.011	-.134	-.538**
	Sig. (2-tailed)	.824	.545		.988	.959	.534	.007
	N	24	24	24	24	24	24	24
Water_ pc	Pearson Correlation	-.987**	.431*	.003	1	-.998**	-.760**	.155
	Sig. (2-tailed)	.000	.036	.988		.000	.000	.471
	N	24	24	24	24	24	24	24
lnPop	Pearson Correlation	.981**	-.401	-.011	-.998**	1	.794**	-.163
	Sig. (2-tailed)	.000	.052	.959	.000		.000	.446
	N	24	24	24	24	24	24	24
Unempl oyment	Pearson Correlation	.712**	-.114	-.134	-.760**	.794**	1	-.100
	Sig. (2-tailed)	.000	.596	.534	.000	.000		.643
	N	24	24	24	24	24	24	24
GasSha Re	Pearson Correlation	-.108	-.413*	-.538**	.155	-.163	-.100	1
	Sig. (2-tailed)	.617	.045	.007	.471	.446	.643	
	N	24	24	24	24	24	24	24

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Author own calculations

The results of correlation matrix are described below:

the correlation matrix results show that there is a strong negative correlation between GDP and Water per capita availability ($r = -0.987$, $p < .001$) indicates that GDP growth has coincided with declining per capita water availability. This reflects growing demographic pressure, where economic expansion masks ecological stress. There is a very strong positive correlation between GDP and population growth ($r = .981$, $p < .001$) confirms that GDP has expanded in response to population growth, underlining a scale-driven rather than productivity-driven economy. Similarly, there is a strong positive correlation between GDP and unemployment ($r = .712$, $p < .001$) imply that economic growth has not proportionally reduced unemployment, reflecting jobless or nominal growth. The analysis found a moderate positive correlation between agriculture and water availability per capita ($r = .431$, $p = .036$) proving that agriculture benefits from required water availability, indicating dependency on irrigation water. There is negative correlation between agriculture and GDP ($r = –.463$, $p = .023$), pinpointing a structural investment and labor shift from agriculture to other sectors of economy as economy expands. There is also a strong negative correlation between industry and share of natural gas ($r = –.538$, $p = .007$) and it suggests that reductions in gas availability lowers industrial output, confirming the sector's significant reliance on energy supply. Further, Agriculture shows weak correlation with unemployment rate and industry, while Water per capita availability is negatively correlated with population growth ($r = –.998$, $p < .001$), reinforcing the demographic significant effect. Thus, the analysis confirms three key dynamics: (i) GDP growth is scale-driven but ecologically unsustainable, (ii) agriculture is directly water-dependent, and (iii) industry is energy-dependent rather than water-driven. These results provide a solid foundation for regression analysis in the next section. The correlation analysis results are shown in Figure 5.

Regression Analysis

Model 1: Agriculture vs Water_pc

Table 3: Model 1- Agriculture vs Water_pc

Model	Variable	B (Unstandardized)	Std. Error	Beta (Standardized)	t	Sig.	R^2	Adj. R^2	F (df=1,22)	Sig. (ANOVA)	DW
1	Constant	18.337	1.925	–	9.525	.000	.186	.149	5.016	.036	0.325
	Water_pc	0.015	0.007	0.431	2.240	.036					

The findings of regression analysis predict that per capita water availability has a statistically significant positive impact on agriculture's share of GDP in the long-term. The model explains 19% of the variation in agriculture (% of GDP) ($R^2 = 0.186$), indicating a moderate level of explanatory power. The unstandardized coefficient ($B = 0.015$, $p = .036$) means that for every 1 cubic meter increase in water availability per capita, agriculture's contribution of GDP increases by approximately 0.015 percentage points. Although the effect is modest, yet the significance level highlights agriculture's direct reliance on freshwater resources, consistent with Pakistan's agriculture dependence on irrigation water system. The low R^2 further implies that, besides water availability, other factors like technology, input cost, market access, and climate variation also play crucial roles in shaping agricultural production.

Model 2: Industry vs GasShare

Table 4: Model 2—Industry vs GasShare

Model	Variable	B (Unstandardized)	Std. Error	Beta (Standardized)	t	Sig.	R^2	Adj. R^2	F (df=1,22)	Sig. (ANOVA)	DW
1	Constant	23.951	1.466	–	16.340	.000	.290	.257	8.971	.007	0.977
	GasShare	–0.126	0.042	–0.538	–2.995	.007					

The regression analysis predicts that the non-availability of natural gas has a significant negative impact on the industrial sector's production and its share in total GDP. The model explains 29% of the change in industry (% of GDP) ($R^2 = 0.290$), suggesting a moderate level of explanatory power of the model. The regression coefficient (B = –0.126, p = .007) indicates that a 1% decrease in natural gas share in electricity generation is associated with a 0.126 % decline in industry's share in total GDP. The negative standardized beta sign (–0.538) supports the strength of this inverse relationship. These findings highlight that Pakistan's industrial sector is highly energy-dependent, and energy shortages have a direct adverse effect on industrial output.

Model 3: lnGDP vs lnPop & Unemployment

The empirical findings of model 3 predict that Pakistan's GDP (log-transformed) is strongly influenced by population growth and unemployment during 1998–2021. The model has an exceptionally high explanatory power, with $R^2 = 0.974$, meaning that 97.4% of the change in GDP is accounted for by the two variables: population growth and unemployment rate.

Table 5: Model 3—lnGDP vs lnPop & Unemployment

Model	Variable	B (Unstandardized)	Std. Error	Beta (Standardized)	t	Sig.	R^2	Adj. R^2	F (df=2,21)	Sig. (ANOVA)	DW
1	Constant	–50.082	3.874	–	–12.928	.000	.974	.972	397.880	.000	1.683
	lnPop	3.991	0.204	1.123	19.523	.000					
	Unemployment	–0.051	0.016	–0.179	-3.111	.005					

The coefficient for population is positive and highly significant (B = 3.991, $p < .001$; $\beta = 1.123$), suggesting that population growth is the key driver of GDP growth. This finding reflects Pakistan's demographic significant impact, which means that a population growth fuels aggregate GDP, even if per capita productivity remains low. In contrast, unemployment rate shows a significant negative association with GDP growth (B = –0.051, p = .005; $\beta = –0.179$). This implies that higher unemployment rate reduces the efficiency of economic growth due to low labor force participation and household income. Thus, Pakistan's economy appears scale-driven but not efficiency-driven, raising concerns about sustainable development and inclusive growth.

Robustness checking through diagnostic tests

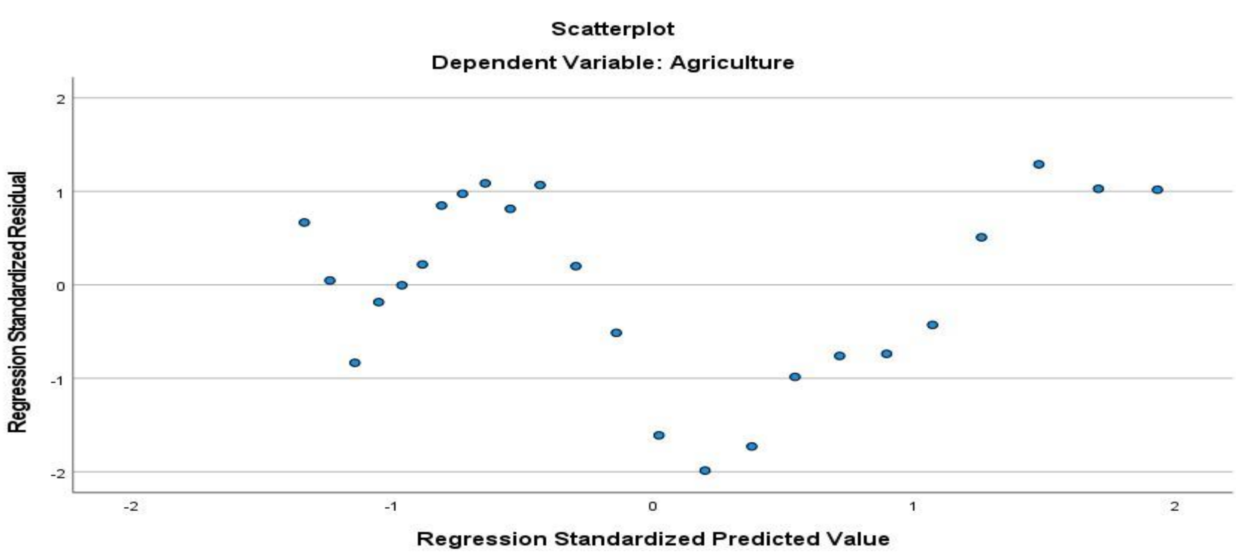
Table 6: Summary of Regression Model Diagnostics for Agriculture, Industry, and lnGDP (1998– 2021)

Model	Durbin–Watson	Residual Range (Std.)	Outliers Detected	Collinearity (Tolerance > 0.3, VIF < 3)
Agriculture vs Water_pc	0.325	–1.987 to +1.290	None	No multicollinearity
Industry vs GasShare	0.977	–2.014 to +1.399	None	No multicollinearity
lnGDP vs lnPop & Unemployment	1.683	–1.888 to +1.920	None	No multicollinearity

Source: Authors own calculations.

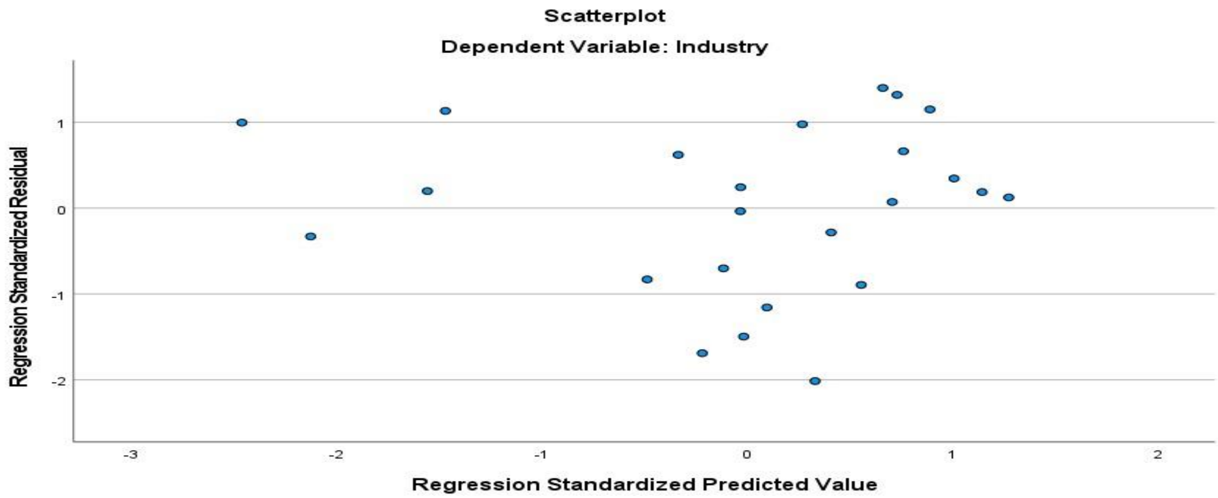
Various diagnostic tests were used to check the reliability of the three estimated models. The Durbin–Watson statistics shows the degree of autocorrelation in residuals: Agriculture (0.325) and Industry (0.977) suggest positive autocorrelation, which is less reliable error independence. In contrast, the GDP model (1.683) is closer to the ideal range of 1.5–2.5, indicating independent residuals. Examination of residual plots shows all standardized residuals falling within ±2 range, confirming no extreme outliers that might bias the estimates. Collinearity diagnostics reveal tolerance values above 0.3 and VIF values below 3, suggesting no severe multicollinearity problems among predictors. While the Agriculture and Industry models face autocorrelation issues, the GDP model is robust and statistically robust and reliable.

Figure 5: Scatterplot (Agriculture Model)



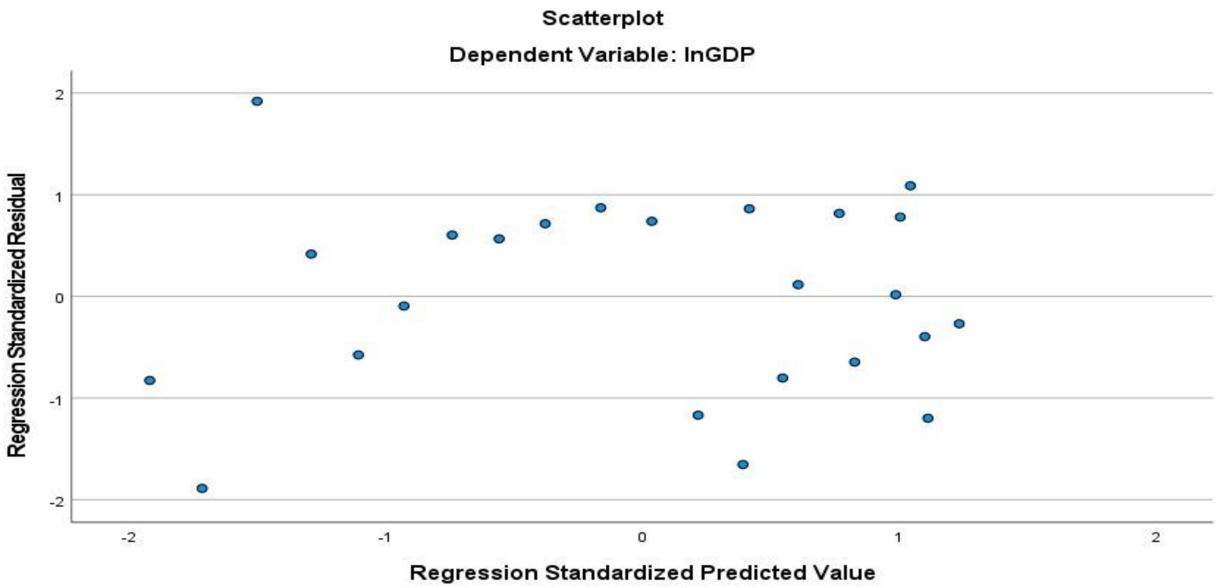
The scatterplot of standardized residuals against standardized predicted values for the agriculture model indicates a random distribution of points around the zero line. This suggests that the assumption of homoscedasticity (constant variance of errors) is significantly satisfied, though a slight pattern can be observed, indicating some mild deviations. There is no evident funnel-shaped or clustering effect, suggesting that the residuals are equally distributed across the predicted values. The standard deviation of most residues is within the range of ±2, indicating that there are no outliers. The regression assumptions are satisfied and, therefore, the model is statistically reliable and good fit of the model.

Figure 6: Scatterplot (Industry Model)



The scatterplot of the industry model's standardized residuals versus predicted values indicates a scattered distribution, with the residuals distributed in both positive and negative directions. Although many of the residuals fall within the range of ±2 standard deviations, a few points are near extremes, indicating the existence of some small outliers. There is no systematic trend (curvature or funneling) in the spread, indicating that the hypothesis of the linearity and uniformity of sigma is confirmed. The concentration of points around some of the predicted values reflects the variability which may not be completely modeled. The residual distribution validates the model, but the unexplained variance is moderate.

Figure 7: Scatterplot (lnGDP Model)



The scatterplot of standardized residuals versus predicted lnGDP values in the figure above shows that the distribution is random around zero, satisfying the linearity assumption. The residuals are within ±2 standard deviations, indicating no extreme outliers. The distribution of residuals is not excessive, and some clustering can be observed, suggesting small heteroscedasticity. There is no systematic curve or funnel effect, indicating that the model effectively captures a linear relationship among GDP, population growth, and the unemployment rate. The residuals indicate that the regression model has strong statistical properties, with very little unexplained variance.

Discussion

The findings provided valuable insights into the interplay among water availability, sectoral contributions, population growth, the unemployment rate, and economic growth in Pakistan during 1998-2021. Key findings of the study are given below:

The regression analysis indicates that the share of the agriculture sector in GDP decreased significantly due to the unavailability of water per capita at the required level, reflecting the agriculture sector's high dependence on irrigation. Descriptive and trend analyses also confirm a sharp decrease in per capita water resources, pointing to an escalating water scarcity crisis as reported by Hussain et al. (2020) and Saikia (2024). The industrial sector also relied heavily on electricity generated from natural gas. Natural gas reserves are rapidly depleting, undermining the industrial share of total GDP. Thus, the first Hypothesis (H1) is confirmed by empirical evidence. GDP expansion was mainly driven by population growth, while unemployment had a significant negative impact on GDP growth. Correlation analysis revealed agriculture’s declining share of GDP and industry’s dependence on energy supply, as reported by Rehman and Habib (2023) and Vargas and Cooper (2024). The overall findings demonstrated that natural resource constraints restrict Pakistan’s fast economic growth. The agriculture sector is suffering from a shortage of irrigation water, while the industrial sector is declining due to an energy crisis. Although population growth is a core driver of economic growth because of its role in manufacturing goods and services and in agricultural output, the rising unemployment rate negatively impacts the overall economy and poses sustainability challenges. These findings corroborate the studies of Kiran and Gardezi (2024) and Nazli et al. (2024). Hence, the second hypothesis (H2) is confirmed by hard evidence. The negative relationship between natural resource depletion and the productivity of the agricultural and industrial sectors reflected structural imbalances in the economy. Water shortages, energy crises, and weak governance precipitate inefficiencies across sectors. Therefore, the third hypothesis (H3) is supported by empirical evidence.

Conclusion

Pakistan's economy has been facing severe problems, including persistent water shortages, recurring energy crises, rapid population growth, widespread unemployment, and environmental degradation. Over the last three decades, Pakistan has recorded significant economic growth, but this growth has been based on ecological degradation, indicating that the economic growth model is unsustainable in the long term and needs revision by following strategies that create a balance between growth and environmental improvement. The industrial and agricultural sectors are major parts of the economy, accounting for around 41% of total GDP, and are suffering due to a lack of irrigation water and an energy crisis. There is an urgent need to construct water reservoirs to reduce water shortages for irrigation, and to use renewable resources and green technologies to accelerate power generation from cheap sources, thereby reducing the high cost of electricity and petroleum products. Although the country has recorded economic growth over time, this progress has often come at the expense of ecological damage, suggesting an unsustainable development model. The evidence confirms that natural resources act not merely as inputs for production, but as foundational pillars for long-term economic stability and sustainable growth, as suggested by Wang & Azam (2024), Ikpe & Oyedeji (2023), Wang & Azam, 2024; Begum & Ali (2025), and Maja & Ayano (2021).

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