

Analyzing the Relationship between Natural Resources Rents and Nepal's Gross Domestic Product

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Received: June 3, 2021

Revised: August 24, 2021

Accepted: September 3, 2021

How to Cite:

Dangal, D. N., Chapagai, S. D., & Ghimire, K. P. (2021). Analyzing the relationship between natural resources rents and Nepal's gross domestic product. *Economic Review of Nepal*, 4(1), 21–29.
<https://doi.org/10.3126/ern.v4i1.64115>

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Abstract

The objective of this study is to analyze the relationship between natural resources rents and Gross Domestic Product (GDP), using the descriptive research design. The study collected quantitative data from the World Bank, covering the period from 1970 to 2020. Upon analyzing the relationship between gross domestic product (GDP) and total natural resources rents to GDP, the study found a statistically significant negative Pearson's correlation of -0.423 and a highly significant negative Spearman's rho correlation of -0.849. These findings indicate that there was a complex relationship between GDP and natural resources rents. The study suggests negative association between GDP and natural resource rents, providing insights into the importance of efficient use of natural resources in promoting sustainable economic growth.

Keywords: natural resources rents, sustainable, economic development, significant

Introduction

Natural resources rents refers to the revenue generated from the extraction and utilization of natural resources. Nepal has a wealth of natural resources including water, forest, and mineral resources. Natural resources are essential for Nepal's development as they are used in agriculture, tourism, power generation, job creation, foreign exchange, and environmental management. Natural resources are free-to-use, productive resources created by nature. They are also known as natural capital. It's no secret that natural capital is just as important for a country's development as physical capital and human capital (MOF, 2018). Natural resources are an essential part of the manufacturing process that contributes to the vitality of the economy for long-term development (Barma et al., 2012). A common way to assess the health of an economy is to examine the growth of its Gross Domestic Product (GDP). However, since multiple factors can influence GDP growth, it is very difficult to analyze these correlations using traditional methods. There have been numerous attempts to measure GDP growth using various inputs (Jovic et al., 2016). The economic growth is commonly defined as the continued increase in a country's production and consumption of goods and services over time, frequently measured by the growth rate of the GDP (Mankiw et al., 1920). Economic growth is a major indicator of a nation's prosperity, reflecting the

increase in the production and consumption of commodity and services over time, often measured by the growth rate of the GDP (Jones, 2016). Nepal has a wealth of natural resources including water, forest, and mineral resources. Natural resources are essential for Nepal's development as they are used in agriculture, tourism, power generation, job creation, foreign exchange, and environmental management. Torvin (2002) found that the reduction in income caused by this factor is greater than the increase in income resulting from natural resources. Auty and Furlonge (2019) in many countries, abundant resources have not been able to keep up with economic growth and development.

As Nepal is undergoing economic transformation and policymakers are looking for sustainable strategies, it is important to understand the impact of resource use on GDP to conduct this study. What is the relationship between natural resources rents and Nepal's Gross Domestic Product (GDP)? The objective of this study is to analyze the relationship between natural resource rents and Nepal's GDP.

Literature Review

There are very few studies on the impact of natural resource rents on the economic growth of countries. Some of the relevant related studies to the subject matter were reviewed below.

Gylfason and Zoega (2006) found increasing dependence on natural resources can be detrimental to economic development. However, natural resources like mineral, gas, oil can be managed and utilized to decrease poverty levels and promote growth and development. Papyrakis and Gerlagh (2007) discovered that natural resources abundance reduces investment, education, transparency, and research and development spending, while simultaneously increasing corruption. Sala and Subramanian (2013) revealed that natural resource dependence has a negative impact on health outcomes dependence has a negative impact on health outcomes.

The study by Alarallah (2021), Bayce and Emery (2011), Ben Salha et al. (2018), Ben-Salha et al. (2021), Brunnschweiler (2008), Canh et al. (2020), Hamdi and Sbia (2013), Hadj & Ghodbane (2021), Hassan et al. (2019), Moshire and Hayati (2017), Mehar et al. (2018), Shahbaz et al. (2018), and Zalle (2019) resulted in a positive and significant impact of natural resources rents on economic growth.

Jovic et al. (2016) focused on determining which of the five natural resource rents has the greatest impact on economic development, measured by GDP. The study revealed that forest rents have the greatest impact on GDP. Kin and Lin (2017) found that natural resource dependency has a positive impact on education attainment, but a negative impact on health outcomes.

Sinha and Sengupta (2019) found that individual natural resource rents have a positive effect on HDI whereas the rents earned from the pool has a negative effect on HDI in the presence of globalization. The effects of the natural resource rents on HDI are reversed in the presence of government and strong institutions. Elamin Mohamed (2020) study found that natural resource rents and development spending have a positive impact on economic growth in short term but a negative impact in long term. The study also found life expectancy at birth, school enrollment, and financial development negatively impact long term economic growth. Redmond and Nasir (2020) revealed that a positive and significant impact of an

abundance of natural resources on economic growth, but a negative effect on human development. Sun et al. (2020) results demonstrated a negative and significant impact of natural resource rents on financial development for emerging seven (E-7) economic. Economic development is positively affected by the increase in human capital. Guan et al. (2020) showed that there is a significant relationship between natural resource rents and financial development in China. Results of Khan et al. (2020) indicated a negative and significant impact of natural resource rents on economic development.

Ampofo et al. (2020) study found that natural resource rents play a crucial role in promoting economic growth in various countries. The study found that Australia, Canada, the Democratic Republic of Congo and India are among the countries that have experienced significant long-term benefits from these rents. Saudi Arabia and majority of countries have only witnessed short term effect.

According to Yildirim et al. (2020), natural resource rents have a positive effect on long-term economic development. However, in the short run, these rents do not seem to have any effect on financial growth of several countries including Albania, Argentina, Argentina, Brazil, Bulgaria, China, Colombia, Georgia, Iran, Kazakhstan, Malaysia, Mexico, Peru, Romania, South Africa, Thailand and Turkey. Shahbaz et al. (2013) and Joshua and Bekun (2020) found natural resource rents have positive effect economic development, but a negative impact on environment.

While there have been several studies conducted on the impact of natural resource rents on economic growth in various countries around the world, there is a lack of research on the impact of natural resource rents on the economic growth of Nepal. Therefore, further research is needed to explore the effects of natural resource rents on Nepal's economic growth and development.

Methods and Procedures

This study aims to analyze the relationship between natural resource rents and Nepal's GDP. It employs a descriptive research design based on panel data from 1970 to 2020. The quantitative data used in this study were obtained from the World Bank (2020), and World Development indicators. The study applies Pearson's and Spearman's rho correlation coefficient to estimate the relationships between total natural resources and GDP in Nepal. The data were examined using the statistical package for the social sciences (SPSS) and descriptive statistics was employed to present the data through percentage ratio.

Result and Discussion

The dataset covered the period from 1970 to 2020 and provides insights into the proportion of natural resource rents to GDP over the years, showcasing the part of natural resource rents relative to the GDP over the years. The data showed significant fluctuations with remarkable peaks in the late 1970s and early 1980s, indicating a high reliance on natural resources during those periods, which could be attributed to global economic conditions or changes in resource prices. The year 1977 stands out with an exceptionally high ratio, suggesting a significant share of natural resources in the GDP, possibly linked to specific economic events or resource booms. However, the early 1980s and late 2010s demonstrated relatively lower ratios, hinting at potential economic diversification in resource management strategies (Figure 1). A cyclic pattern is evident, characterized by peaks and troughs at

somewhat regular intervals, prompting further exploration into the factors contributing to these cycles. Recent years show a decline in the ratio, reaching a low point in 2018 signifying a potential shift in economic structure, policy measures, or susceptibility to global commodity price fluctuations.

Figure 1

The Trend of Natural Resources Rents to GDP in Nepal

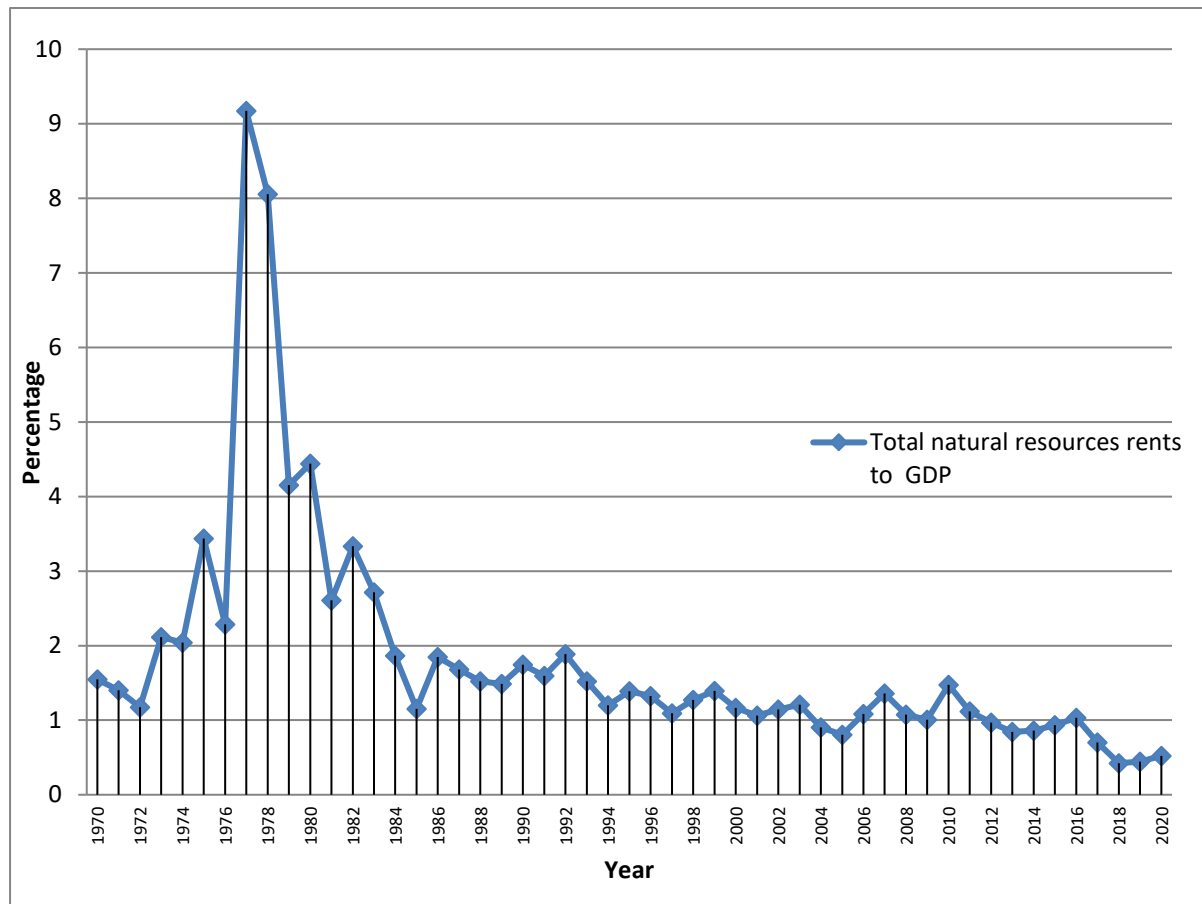
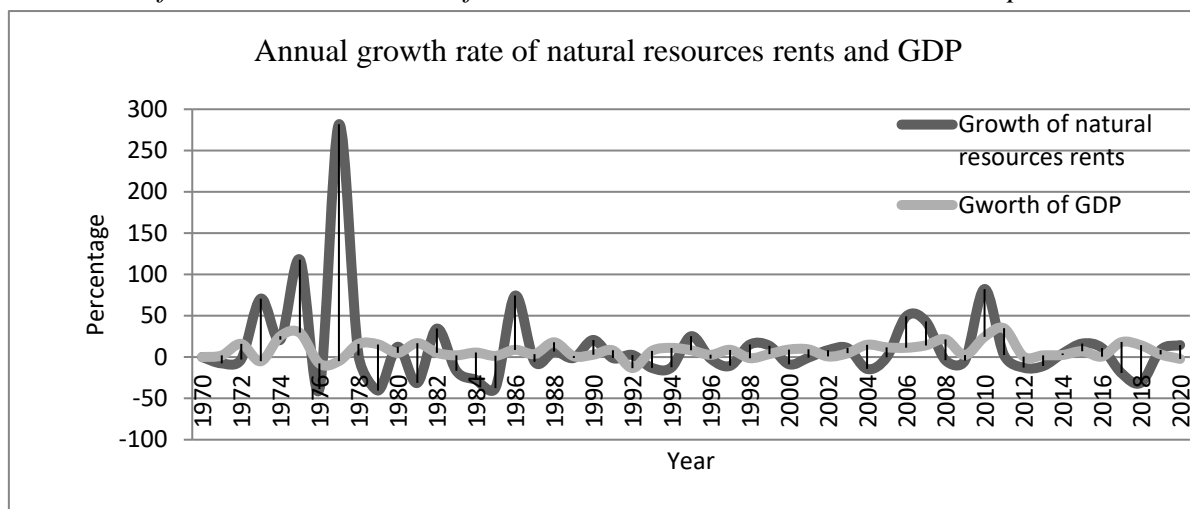


Figure 2 shows the annual changes in natural resource rent and GDP growth between 1970 and 2020, providing insight into economic dynamics during this period. The highest natural resource rents were observed in 1975 (117.95%), and 1977 (281.87%), indicating significant increases in revenue from natural resources in those years. However, there were significant drops in the following years: 1976 (-38.67), 1979 (-40.52%), and 1985 (-37.28%), indicating challenges or decreased profitability in utilizing natural resources during those years. Meanwhile, GDP growth showed variations, with positive and negative figures reflecting economic expansions. Positive GDP growth occurred in years 2010 (82, 40%), 2011 (34, 81%), 2008 (-3, 80%), and 2018 (-31, 07%). However, the relationship was not consistent. For in 2008 when natural resource rents decreased (-3.80%), GDP grew substantially (21.50%). the data reveals a dynamic interplay between natural resource rents and GDP growth, with peaks and troughs indicating shifts in economic conditions and resource utilization. These fluctuations highlight the importance of an understanding of the factors influencing the relationship between natural resources and economic performance in a nuanced way.

Figure 2

The Trend of Annual Growth Rate of Natural Resources Rents and GDP in Nepal



The analysis of the relationship between GDP and total natural resources rents to GDP indicates a statistically significant negative Pearson's correlation of -0.423. This implies that when GDP increases, the proportion of total resource rents to GDP trends to decrease, and vice versa. Moreover, the correlation coefficient between total natural resource rents to GDP is also -0.423, implying a consistent negative relationship between two variables (Table 1). Both correlations are significant at the 0.001 level, which suggests that their result are reliable. The Spearman's rho correlation analysis reveals a strong and consistent relationship between the GDP and total natural resource rents to GDP with a highly significant negative correlation of -0.849. This implies that when there is an increase in GDP, the proportion of total resource rents to GDP trends to decrease, and vice versa (Table 1). The significance level of 0.000 indicates that this relationship is highly unlikely to be due to random chance, making this finding robust. The finding contrasts with the results of studies carried out by Torvin (2002), Papyrakis and Gerlagh (2007), Auty and Furlonge (2019) Elamin Mohamed (2020), Redmond and Nasir (2020), Sun et al. (2020), Khan et al. (2020), and as there are not consistent with the findings of the studies conducted by Auty and Furlonge (2019), Elamin Mohamed (2020), Khan et al. (2020), Papyrakis and Gerlagh (2007), Redmond and Nasir (2020), Sun et al. (2020), Torvin (2002), and as there are not consistent with the findings of the studies conducted by Aljarallah (2021), Ampofo et al. (2020), Bayce & Emery (2011), Ben Salha et al. (2018), Ben-Salha et al. (2021), Bunnschweiler (2008), Canh et al. (2020), Elamin Mohamed (2020), Guan et al. (2020), Gylfason and Zoega (2006), Hadj & Ghodbane (2021), Hamdi & Sbia (2013), Shahbaz et al. (2013), Hassan et al.(2019), Zalle (2019), Joshua & Bekun (2020), Jovic et al. (2016), Kin and Lin (2017), Mehar et al. (2018), Moshire and Hayati (2017), Redmond and Nasir (2020), Sala and Subramanian (2013), Shahbaz et al. (2018), Sinha and Sengupta (2019), and Yildirim et al. (2020). These findings suggest a complex relationship between economic growth and utilization, and changes in GDP are linked to change in the share of naturel resources rents in GDP. This provides insights into the importance of efficient use of naturel resources in promoting sustainable economic growth.

Table 1

Pearson's and Spearman's Rho Correlation Between GDP and Total Natural Resources Rents

		GDP	Total natural resources rents to GDP	
GDP	Pearson Correlation	1	-0.423	
	Sig. (1-tailed)		0.001	
Total natural resources rents to GDP	Pearson Correlation	-0.42	1	
	Sig. (1-tailed)	0.001		
Spearman's rho	GDP	Correlation Coefficient	1.000	
		Sig. (1-tailed)	.000	
		Total natural resources rents to GDP		
	Total natural resources rents to GDP	Correlation Coefficient	-.849	1.000
		Sig. (1-tailed)	.000	

Note. Output of SPSS

Conclusion

The analysis covers data spanning from 1970 to 2020 reveals significant fluctuations in the proportion of total natural resource rents to GDP. Statistical analysis underscores a consistent negative correlation between GDP and total natural resource rents to GDP. This highlights the complex relationship between economic growth and resources utilization. These findings have implications for policy formulation, resource management, and economic planning. They emphasize the need for nuanced understanding and further research to unravel the underlying dynamic driving these trends. Further research could investigate the impact of other factors, such as technological advancements and Government policies, on the relationship between GDG and natural resources rents.

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Appendix

Year	GDP	Total natural resources rents to GDP	Total natural resources rents
1970	865975307.8	1.5473	13399543.54
1971	882765470.7	1.4023	12378851.66
1972	1024098398	1.1750	12032731.58
1973	972101725	2.1133	20543520.03
1974	1217953547	2.0398	24843374.04
1975	1575789254	3.4361	54145698.8
1976	1452788944	2.2857	33205844.37
1977	1382400000	9.1727	126803239

Year	GDP	Total natural resources rents to GDP	Total natural resources rents
1978	1604162497	8.0551	129217188.7
1979	1851250008	4.1516	76855997.58
1980	1945916583	4.4429	86454199.61
1981	2275583317	2.6080	59348212.88
1982	2395423680	3.3316	79805780.52
1983	2447174804	2.7156	66455064.82
1984	2581207388	1.8650	48140064.22
1985	2619913956	1.1525	30193523.89
1986	2850782093	1.8464	52636009.49
1987	2957255380	1.6801	49685393.09
1988	3487009748	1.5217	53062647.21
1989	3525225833	1.4887	52480175.06
1990	3627560282	1.7467	63362737.02
1991	3921476085	1.5962	62593081.86
1992	3401211581	1.8874	64192959.53
1993	3660041667	1.5235	55760002.69
1994	4066775510	1.2000	48802410.18
1995	4401104418	1.3888	61123043.74
1996	4521580381	1.3262	59967424.47
1997	4918691917	1.0907	53646570.41
1998	4856255044	1.2717	61756028.82
1999	5033642384	1.3948	70210173.64
2000	5494252208	1.1671	64121135.28
2001	6007055042	1.0606	63713680.31
2002	6050875807	1.1418	69090132.85
2003	6330473097	1.2101	76603771.16
2004	7273938315	0.9017	65590197.06
2005	8130258415	0.8059	65523448.49
2006	9043715356	1.0819	97840381.28
2007	10325618017	1.3570	140114709.2
2008	12545438605	1.0744	134784563.9
2009	12854985464	1.0048	129172612.5
2010	16002656434	1.4723	235606631.8
2011	21573872274	1.1168	240937292
2012	21703100747	0.9676	210003228.8
2013	22162205046	0.8448	187219837.7
2014	22731612827	0.8607	195655330.2
2015	24360801338	0.9349	227746753.1
2016	24524109484	1.0312	252897654.3
2017	28971588880	0.7033	203746145.6
2018	33111525183	0.4242	140444673
2019	34186180696	0.4462	152535095.6
2020	33433659224	0.5226	174734634.4

Note. https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=NP&most_recent_year_desc=true