

# Impact of Mineral Resources on Economic Growth of Pakistan

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## Abstract

Natural resources are backbone of any country development. Many past study shows that the countries with natural resource abundance tend to grow slowly and natural resources has negative impact on economic growth and development of country. In these natural resources mineral and fuel is one of important resource and Pakistan is known to have abundant minerals resources but their contribution in economy has not been explored significantly up till now. We intend to explore empirically relationship between production of minerals and fuel and their impact on GDP in Pakistan. These minerals include natural gas, oil, gemstone, marble and coal.

**Keywords:** economic development, natural resource, coal

## Chapter # 1Introduction:

### 1.1 Introduction to the Report:

Natural resources are necessary for industrial and agricultural development of any country. It play dominant role in progress and prosperity of country. Economic development of any country is not possible without natural resources. Pakistan has large amount of natural resource i.e. fertile land, large pool of human resource and important minerals resource. Pakistan's minerals consist one of the world largest reserves of minerals including coal, gold, copper, gas, chrome, limestone, gemstone and marble. Pakistan has great potential of geological endowment. Pakistan's four provinces are blessed with mineral resources especially Baluchistan and Khyber pakhtun khawa is rich in natural resources i.e. Gas marble, limestone, gemstone and copper. There is world best deposits of marble are found in FATA. But endowment of these marble required technology and great skills and in Pakistan mining based on century old techniques. Mineral department is weak in coordination and some time work in non transparent manner, ignoring the mandatory requirement for grant of licenses and lease under political influences. All these issues create problem in mining and does not affect the economy positively. So I want to check the impact of mineral resources on economic growth in Pakistan.

### 1.2 Research question:

In this study the impact of mineral resource production on economic growth will be examine. Secondary data source will b used for gathered information regarding all variables. The main research question is how mineral resource effect economic growth of Pakistan either these resource effect economic growth positively or negatively

### 1.3 Objective:

Objective of this study is to check empirically the relationship between mineral resource production and its impact on economic growth of Pakistan. Impact of mineral production is negative or positive with some supporting and control variables.

### 1.4 Significance of research:

There is not much work have been done on this subject in Pakistan so this study will also help the students to do further research on impact of mineral on economic growth. Natural resource abundance is considered as a blessing from time of early economic theory. But many studies show negative relationship between natural resource abundance and economic growth. A common feature of past paper that have shows empirical study mostly use cross country and panel data for large number of countries endowed by using different type of resources whose growth impact might be differ. Unfortunately country case study is uncommon in literature by using econometric economic techniques with exception being George edu(2001) and Malik, Hussain and chaudhry (2009). Aim of my study to fill the gap in existing literature by expanding the scope of country case studies. This study is helpful for the economy as it will shows the importance of mineral production and its impact on economic growth. Empirical result will help the policy maker to make their strategy in way that helps in achieving sustainable economic growth.

### 1.5 Limitation of Research:

There is some limitation of study. The first thing is that data on production of mineral is available but the monetary value of production is not available in any currency .The used proxy includes export related to fuel, minerals and lubricants however it is not known that which fuels and which group of minerals and what type of lubricants have been included in these terms. So there is a possibility that the result may not be comprehensively and accurately established. If sufficient and proper required data would have been available the result would have been more

comprehensive, satisfactory and accurate.

#### 1.6 ORGANIZATION OF RESEARCH:

This paper is organized as follows. Section II is literature reviews regarding natural/mineral resource and their impact on economic growth. Section III present model, methodology and data description to investigate the empirical results section IV specifies the tests and growth regression, estimation and results of tests. Section V provide conclusion of research and policy suggestion.

#### Chapter#2 literature review

To analyze the contribution of natural resources to economic growth Malik, Chaudhry and Hussain (2009) carried out a study in Pakistan. For this purpose time series data on different macroeconomic variables including gross domestic product (proxy for economic growth) and Exports related to agriculture, fuel and minerals as percentage of GDP have been taken as proxy for natural resource abundance and investment in human capital, Expenditures on education and health as percentage of GDP and rate of inflation, trade openness and investment as percentage of GDP for the period 1975-2006. Semi linear log test shows that natural resource has negative impact on economic growth. After including development variable total expenditures on education and health as percentage of GDP the result of the association between natural resources and economic growth remained the same.

The paper "national resources abundance and economic growth the case of GHANA" was authored by George adu. Paper examines the relationship between long run economic growth and resources abundance in GHANA nine different variables is used as proxy for resources abundance and after including control variables result shows that LABOR and CAPITAL is positively related with growth, financial development and trade openness and distortions in agriculture incentive is also has positive coefficient and size of public sector has negative coefficient so Secondary empirical result indicate that resource curse hypothesis is not accepted in GHANA because out of nine 8 variable have positive and statistically significant coefficient in all estimated model.

Sachs and Warner (1997) analyzed those economies abundant in natural resources and their impact on economic growth. Study held in 95 developing countries where annual growth rate from 1970 to 1990 measured. Cross sectional growth regression shows Negative relationship that higher share of primary export decreases growth. After controlling large number of additional variable research indicate negative relation between resource intensity and subsequent growth.

Wright and Czelesta (2003) carried out a study in Latin American countries cross country regression was used to measured and impact of different mineral such as copper, gold, silver, lead, cobalt, zinc and coal on average annual growth rate using time series micro economic variables from 1978-2001. They concluded that successful resource base development is not a matter of geological endowment but it also require a large scale investment in exploration, transportation, geological knowledge technology of extraction, refining and utilization. Insecure ownership of mineral has adverse effect on production and exploration not the resource abundance.

Jean Phillip c stigins (2000) check whether there is relationship between natural resources abundance and economic growth Variables i.e OILR(oil), GASR(gas), COALR(coal), MINR1, MINR2 used. The effect of each variable on economic growth is checked. First land is positively correlated with log of the ratio of GDP deflator in 1970. Oil and gas is negatively related coil abundance is clearly associated with faster real growth. Mineral resources are negatively correlated with real GDP so this paper concludes that natural resources abundance may affect economic growth through positive and negative channels.

Natural resources abundance and economic development lesson from Indonesian experience (2008) by shinj asanuma purpose is twofold revisited the resource curse issue and secondly experience of Indonesia. In past some economist say natural resource curse is solid fact but some refuse it. The first argue is that curse is related to primary commodities, agriculture, fuel and mineral. When country has large primary sector it crowd out the development of manufacturing sector so economic growth is slow. The other school argues that nature of curse is different. The different activities of oil, gas and minerals generate rent revenue to the state which is ultimate owner of country. But the case of Indonesia it is not curse but blessing it indicate that developing country may achieved it if policy frame work is good.

chong- sup kim and yeon sil kim investigate relationship between economic growth and natural resource abundance on the basis of sachs and warner(1995) from 1970 to 2005 this paper provide empirical result after including other variable using cross sectional data analysis estimate  $GDP(Y_{1970}-Y_{2005})/Y_{1970}$  as base. Relationship between economic growth and export ratio is negative even after including dummy variables over last 35 year. They also examine that institutional change and faster capital accumulation high quality of human capital can lead to support the positive effect on economic growth.

Tobias kronenberg (2004) examines the effect of natural resource abundance on economic growth performance of transition economies during 1990. Proxy variable is used one is the share of primary good in total export and other is per capita growth after regression it shows negative relation between both where P- value close to zero and  $R^2$  is close to 70% which means two third variation in per capita growth, after including other

explanatory variables P- value is high than simple regression but it is still lower than one percent other variable as trade liberalization, capital formation, human capital and population growth these explanatory variable has positive impact but not vary significant conclusion is that there is strong evidence for curse resource in transition economy.

There are five main channels through which natural resources effect economic growth across countries. Channels are foreign capital rent seeking and corruption public expenditure and education, money inflation and financial capital. Out of which some are positive and some are negatively related to economic growth. The empirical evidence present that heavy dependence on nature tend to directly associated with corruption, inequality and political oppression which has negative effect on growth, paper also suggest that foreign social and human physical and financial capital accumulation is also necessary (Gylfason 2004)

Chumbers and Ting Guo (2009) paper focus on one sector endogenous growth model with renewable natural resources. Theoretical model explain that balance growth path or output rise with utilization of resources and long run rate is increasing return to scale. In model growth is independent variable on government spending, income, investment and trade openness. Secondary data is used and empirical result provides that there is positive linkage between natural resource utilization and economic per capita GDP. Standard fixed method is used to estimate. Deficiency is solving through using generalized method of moment (GMM). This paper finds that BGP's output growth rate is positively related to steady state level of natural resources utilization in production. Finding also suggests that growth strategies based on greater capital formation and openness to trade.

Alayi(2005) analyzed are resource abundance is curse? Natural resource can drive civil conflict as result of different parties struggle to gain control over its revenue. Political elites find easy to control resource and losing their grip on industrialization and urbanization. One problem is fiscal policy and inflation this lead to loss of control over public spending, corruption exerts negative externality, weak government. When government highly depend on natural resources and ignore taxes which are main source of revenue it become weaker. This paper also provides solution for economic growth capital accumulation, infrastructure and government investment is required in resource rich countries. This paper conclude that resource is not problem it is blessing for developing countries.

Wing Ding and Berry C Field explored whether there is negative relationship between natural resource abundance and economic growth. Variable are GDP, IR (investment rate), RL (rule of law), initial GDP, OP is the degree to which the economy is open to world markets. TT is change in term of trade; RD is resource dependence, RE resource endowment Single and complete equation model are used. Result of these model shows strongly negative impact on growth having a resources dependent economy but resource endowment appear to have positive impact on growth.

Richard M Auty (2003) concern with obstacles to sustainable development in resources rich countries Paper provides evidence those low income countries given importer to primary sector. This paper also explains that after world war world trade system start and developing countries start export their primary goods, which increase growth in resources poor countries. Developing countries should accelerate industrialization by protecting infant industry to supplying domestic market. Structure idea is also useful. Paper also suggests that developing countries must improve micro, macro and environmental policies which are main cause of low income countries. Evidence also provide that in 1980 per capita income growth is inversely related to share of natural resource rent in GDP in developing countries.

## **CHAPTER # 3 RESEARCH METHODOLOGY:**

### **3.1 THEORITICAL BACKGROUND:**

Mineral resources abundance is one of the important pillar for regional and country base economic development. From the time of Adam Smith and David Ricardo It has been strongly believed that country endowed with natural resources has superiority over resource poor countries. Its endowment can help countries to diversify and grow rapidly. But some Past research (i.e. Sachs and Warner, 1995; Gylfason, 2000 and 2001; Kronenberg, 2004 etc.) found that natural resource abundance is not necessary for growth and development. Most studies indicate that resource rich developing countries are unperformed as compare to resources poor countries, i.e. Asian tigers and many European countries are developed on the basis of services and manufacturing (Kronenberg, 2004). It is most controversial issue among researcher either natural resource abundance is curse or blessing for country.

In theory identified several channels which cause the natural resource abundance to poor economic growth. First, natural resource abundance leads to civil conflict due to which government loose grip over industrialization and cause policy failure and weakness of institutions by Alayi(2005). This is institutional impact on natural resources. Second natural resource endowment exposes volatility in prices and increase in inflation which cloud have an adverse economic growth. Third natural resource endowment give rise the "Dutch Disease" phenomena that the real exchange rate appreciate in response to positive shocks which reduce tradable sector in economy. Tradable sector is engine for growth especially manufacturing which expands learning- by -doing and due to positive externalities and resource rich countries give less important to this sector. Resources abundance leads to increase in income which reduce other commodities exports (manufacturing) and increase imports.

### 3.2 HYPOTHESIS:

In this study the impact of mineral resource production on economic growth will be checked. The hypothesis of this study will be

H0: Mineral resources production has negative impact on economic growth.

H1: Mineral resources production has positive impact on economic growth.

### 3.3 DATA DESCRIPTION:

This study uses annually time series data for the period 1975 to 2009 for Pakistan. Data has been taken from different sources like Pakistan economic survey for various variables, Hand book of statistics on Pakistan economy by federal bureau of statistics and world development indicator (WDI) for various issues.

### 3.4 MODEL AND VARIABLE:

This paper follows the semi log linear model of Sachs and Warner (1995) and Malik, Chaudhry and Hussain (2009) for resource dependence.

$$\text{Log}(GDP) = \beta_0 + \beta_1(\text{MIN} / \text{GDP}) + \beta_2(\text{EDUE} / \text{GDP}) + \beta_3(\text{EHE} / \text{GDP}) + \mu_1$$

$$\text{Log}(GDP) = \beta_0 + \beta_1(\text{MIN} / \text{GDP}) + \beta_2(\text{EDUE} / \text{GDP}) + \beta_3(\text{EHE} / \text{GDP}) + \beta_4(\text{INF}) + \beta_5(\text{INV} / \text{GDP}) + \mu_2$$

Log GDP is log of Gross Domestic Product and on right hand side (MIN/GDP) production related to mineral as percentage of GDP, EDUE/GDP is the expenditure on education as percentage of GDP, EHE/GDP is the expenditure on health as percentage of GDP, INF is the rate of inflation, and INV/GDP is total investment as percentage of GDP.

### 3.5 OPERATIONAL DEFINITION:

To check this impact of mineral resource on economic growth I will use real GDP as a proxy variable for economic growth, there are three explanatory variables to check the impact of natural resources on economic growth.

Export related to fuel mineral and lubricant as percentage of GDP will be taken as proxy variable for mineral production in country we will follow the method of Sach and Warner (1995) and Malik, Hussain and Chaudhry (2009) for resource dependence measures for resource abundance (share of resource export in GDP)

The other explanatory variable will be investment in human capital because it is an important factor for economic growth and expenditure on education as a percentage of GDP and expenditure on health as percentage of GDP will be used to check the impact of investment in human capital on economic growth. Gylfason (2001) provide empirically negative effect of resource abundance and expenditure on education so it is necessary to check the impact in case of Pakistan.

Third type of variables that we will use it has controlling effect on economic growth. These variables are rate of inflation, and investment as percentage of GDP.

### 3.6 METHODOLOGY:

#### FEASIBLE GENERALIZE LEAST SQUARE:

It computes feasible GLS estimates for a model in which the error term is assumed to follow a first-order autoregressive process. Cochrane- Orcutt procedure is default method in AR1 it discards first observation in data and iteration is terminated when successive estimate of autocorrelation coefficient do not differ by more than 0.001 or after 20 iterations.

## CHAPTER # 4 ANALYSIS AND DISCUSSION:

### ESTIMATION AND RESULT:

Feasible generalize least square methodology has been used in order to check the contribution of mineral resource in economic growth in Pakistan for the period 1975-2009. First I have estimated effect of mineral resource on economic growth without including control variable. The result is reported in table 1. According to results mineral resource production (V3) is negatively related to economic growth and 10 percent significant. Human capital indicator expenditure on health (V2) is negative and insignificant and Durbin Watson is greater than R square which shows significance of test. Our distribution is normal and no multicollinearity in data because all variables are greater than one and less than ten percent.

As for as the second model concerned represented in table 2 mineral resource production (V3) is negative and 10 percent significant while other variables (V2, V5, V6) are negative but not significant. Only expenditures on education (4) is a variable which is positive but not significant. Durbin Watson is greater than R square which shows significance of test. Distribution is normal and no multicollinearity issue exists in data. This shows that export related to fuel, mineral and lubricants could not make positive contribution toward economic growth result remains the same after including human capital indicator, inflation and investment. The indicator of human capital shows that there is no attention devoted to health and education in Pakistan. The other fact can be that due to old

expertise services toward the access of technology because according to stigms (2000) some countries have large reserve of mineral is not because of better endowment but because they have access to geological expertise.

## Chapter # V

### CONCLUSION AND RECOMMENDATION:

#### 5.1 Conclusion:

This study provide the relationship between mineral resource production and economic growth for pakistan using time series from 1975 to 2009. The relationship between mineral/natural resources and economic growth is controvincial. This study shows statistically negative and significant relationship between natural resource and economic growth during sample period. First I estimate in presence of additional variable like human development but when I include some variables inflation and investment as percentage of GDP association between natural resource and economic growth remain the same.

#### 5.2 Recommendation:

The study about the impact of mineral resources on economic growth in pakistan. The limitation of this research will lead to further research. These limitation will help the researches to come up with best and more accurate outcomes.

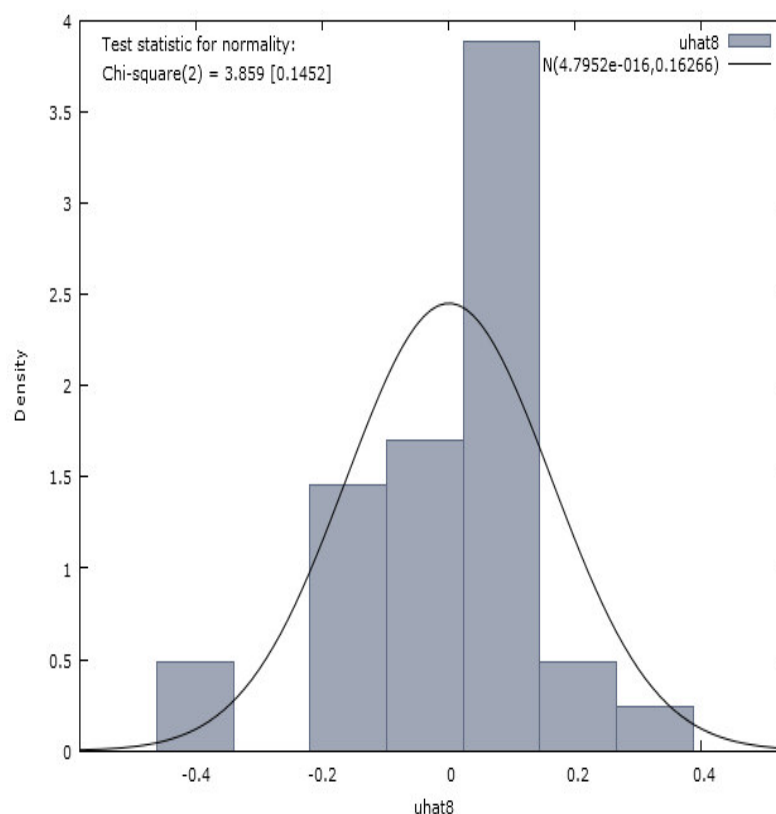
As empirical evidence showed investment in human capital made no contribution toward positive and significant direction in pakistan. It may be due to neglection of these indicators within country. Study indicate that there is no proper attention has been paid to development of human resource in pakistan during sample period. Gross domestic investment is also shows negative contribution and it may be due to less level of investment than required level of investment. This study is never be concluded and there is need to investigate the association between mineral resource and economic growth and also investigate the reason behind negative relationship.

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TABLE 1 Result of FGLS

Dependent variable log (GDP)				
Model FGLS				
Sample 1975-2009				
Variables	Coefficient	Std-error	t-ratio	p-value
const	16.1512	0.35767	45.1564	<0.00001***
V2	-0.3871	1.92909	-0.2007	0.8423
V3	-87.205	7.09612	-12.2892	<0.00001***
V4	19.36	14.8248	1.3059	0.20151
Mean dependent var	14.05		S.D. dependent var	1.346446
Sum squared resid	0.79378		S.E. of regression	0.162663
R- squared	0.98807		Adjusted R-squared	0.986875
F (3,30)	50.7549		P-value(F)	0.986875
Rho	0.25719		Durbin-Watson	1.407723



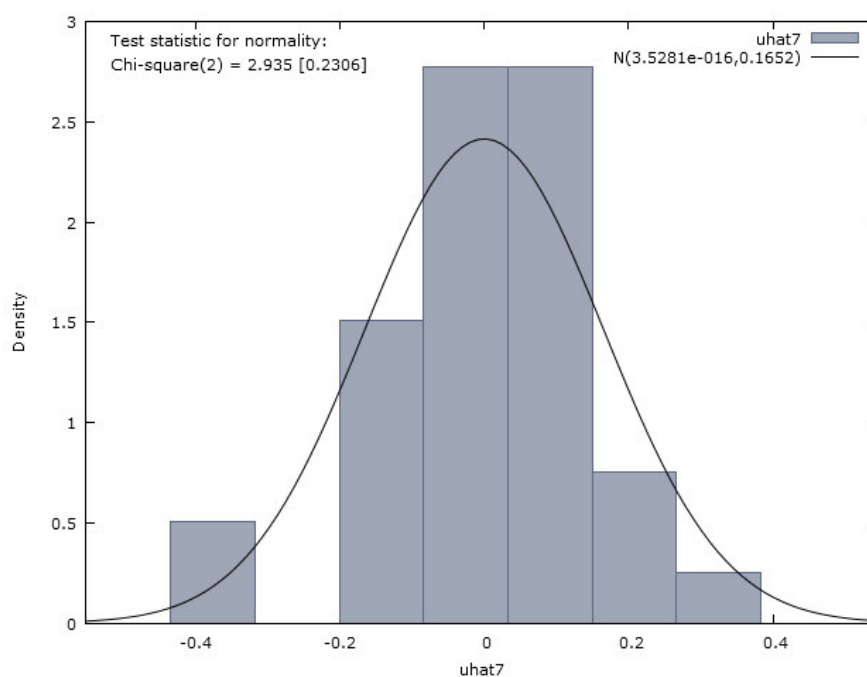
Test Result of Multi Colleanrity

Variance inflation factor	
minimum possible value =1.0	
Values > 10.0 may indicate a collinearity problem	
v2	1.394
v3	1.654
v4	1.257

TABLE 2 Result of FGLS

Dependent variable log (GDP)				
Model FGLS				
Sample 1975-2009				
Variables	Coefficient	Std-error	t-ratio	p-value
const	16.5963	0.623222	26.6299	<0.00001***
V2	-0.854923	2.02636	-0.4219	0.67632
V3	-90.9637	8.17331	-11.129	<0.00001***
V4	22.0537	15.464	1.4261	0.16489
V5	-1.77632	2.72229	-0.6525	0.51939
V6	-0.0082808	0.0092201		0.37677
Mean dependent var	14.05001		S.D. dependent var	1.34645
Sum squared resid	0.764189		S.E. of regression	0.1652
R- squared	0.98807		Adjusted R-squared	0.98631
F (3,30)	29.76669		P-value(F)	2.19E-10
Rho	0.211341		Durbin-Watson	1.48256

TEST FOR NORMALITY



Test Result of Multi Colleanrity

Variance inflation factor  
 minimum possible value =1.0  
 Values > 10.0 may indicate a collinearity problem

- v2 1.394
- v3 1.654
- v4 1.257
- v5 1.262
- v5 1.262
- v6 1.182