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National Mineral Policy and Its Impact on Mining Sector in Odisha

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Abstract
Odisha possesses abundant and diverse mineral resources, presenting significant economic potential in the mining sector. However, the sector's ability to contribute substantially to economic development is contingent upon the legal and policy framework governing it. To ensure sustainable development, it is imperative to establish a comprehensive legal and policy framework, along with appropriate acts and legislations. Despite having extensive mining legislation in place, there are several gaps that require attention through policy reforms to address deficiencies hindering the efficient and effective management of the mineral sector. The main aim of the present study is to examine the impact of mineral policy on mining sector in Odisha in terms of mineral production, revenue generation and employment creation. This study is based on secondary data, collected from various sources such as Director of Mines, Odisha; Odisha Economic Survey; Department of Steel & Mines and has been analysed in MS Excel. This research indicates that the adoption of mineral policy has contributed somewhat to the expansion of the mining sector in terms of mineral production and revenue generation. However, its effectiveness in generating employment within the mining sector appears limited, as the policy tends to prioritize capital-intensive or labor-saving mining methods. Overall, the National Mineral Policy has had a beneficial impact on the mining sector and the overall economic growth. Thus, there is a need for the government to prioritize the implementation of mineral policy.

Keywords: National Mineral Policy, mining sector, Odisha

INTRODUCTION

India has a vast economic potential in the mineral sector owing to its significant and diverse mineral resources. To a greater extent, the potential of mining sector to contribute towards the economic development of the country is influenced by legal and policy framework. Nevertheless, the mining sector at present is challenged by innumerable problems that affect its optimal capacity to contribute towards economic development. A comprehensive legal policy framework, acts and legislations are necessary to ensure that the development of this sector is achieved without harming the social, economic or environmental structure of the nation.

The policy means rules, regulations, principles and procedures laid down by government for regulating, developing and controlling the respective sectors in the country. It is generally directed to achieve particular objectives and provides a framework to enhance the industry's competiveness. The policy

document is comprehensive covering all the key aspects for the development of mining sector. The policy flows out of an intensive consultation process with all stakeholders. It provides guidance and advice to different authorities and the mineral industry. It addresses the challenges and responds to important government commitments. The economic development of a country depends on the quality of its policy framework, the decisions taken, especially the processes involved in formulating each decision. So, policies should be so formulated as to secure equitable distribution of wealth.

REVIEW OF LITERATURE

This section deals with some review of literature regarding contribution and impact of mining sectors in Odisha economy.

Arzoo and Satapathy (2016) made a study on "socio-economic and environmental impact of mining sector in Odisha, India". This is a review article and they tried to explain the mining sector contribution towards wider economy and its impact of mining on environment and its remediation. The findings of the study show that, availability of mines has led to the economic benefit including the development of social and economic infrastructure, manufacturing and construction industries, commercial and public sector activities also improved. It also has adverse impacts on environment and eventually adverse impacts on soil, waterand vegetation of that area lead to impact on human health. The author suggests that for reduce such negative impact government should take some action and proper soil and water treatment must be needed for reduce pollution.

Pradhan and Patra (2014) made a study on "Impact of Iron Ore Mining on Human Health in Keonjhar District of Odisha". This study tried to examine the health status of mining people in the study area. The study is based on primary data. Purposive sampling used for selection of study area. Primary data collected from workers of mines in Banspal block of Keonjhar district of Odisha through a structured questionnaire. In this study descriptive statistics used for data analysis. This study found that mining has both positive and negative impact. While mining sector is beneficial to the economy in terms of its economic impact and the value to other industries of its product, it has also adverse impacts on environment and specially health impacts. This study also found people living in mining area has higher incidence of Acute Respiratory Infections and Malaria disease.

Behera (2015) made a study on "Socio-Economic Impact of Industrialisation and Mining on the Local Population: A Case Study of NALCO Industrial Area, Koraput. Thia study tried to shows the impact of NALCO on the socio-economic profile study area people and also tried to explained the environmental impacts and challenges of NALCO mining. This study is based on primary data and data collected through a specific questionnaire. Data collected from 100 samples in view of the socio-economic effects of NALCO industrialisation and mining. The criteria for selection of villages are more tribal population, pollution, crop loss, approachable, low compensation, health hazards, etc. To evaluate the positive and negative impacts of mining and industrialisation, Social Impact Assessment has used. This study found that there is positive and negative impact of mining activities. Mining contaminated water; the people are suffering from sound pollution, the surrounding villages are affected by smoke, caustic water, and fluids. the agriculture fields' fertility is affected by contaminated water, and crop production also affected. The NALCO mining company change the occupation profile of people from agricultural farming to NALCO contract/wage employment but in terms of salary it is far from satisfactory. NALCO has undertaken some initiatives such as providing jobs, shelter, free education, and free health and infrastructure including

community hall, school building, roads and drainages, drinking water etc; for affected mining area people but in practice NALCO failed to provide the above services satisfactorily to the mining area people.

Aroca (2001) made a study on "Impacts and development in local economies based on mining: The case of the Chilean II region". The aim of the study is to determine the impact of the mining sector on the Chilean II region. An Input Output matrix used to calculate the impact of mining on output, income and employment in the study area. This study found that the mining sector has positive as well negative impact. Positive impact in terms of employment generation and improved in standard of living. This study also found that Standard of living is improved who employed in private mining as compared to government mining company because government company give low salary as compared government company give employment irrespective of productive capacity and skill of worker but private company consider above things. The negative impact is that its affects environment, health of surrounding people. This study found that most of the people suffered from respiratory illness due to mining.

Djibri et al. (2017) made a study on "Artisanal gold mining in Batouri area, East Cameroon: Impacts on the mining population and their environment" and tried to explain impact of artisanal mining on population and their environment. Primary data used in this study. This study was conducted between March and April 2015. Data collected by questionnaires, interviews and focus group discussions. Households selected through simple random and systematic sampling. Excel used for obtaining tables and figures. The study found that artisanal mining crate employment, though they get money but their standard of living not improving because of mismanagement of money. The negative impact of artisanal mining has on both the population and the environment such as: High rate of school drop outs, poor hygienic, health challenges, high rate of prostitution which leads to the spread of STIs, deforestation, loss of forest ecosystem, land degradation, air pollution and water pollution. They also different type of health problem such as heart problem, skin rashes, muscle pain, cough, water borne disease and sexually transmitted infections (SITs) due to mining.

Hilson (2002) made a study on "Small-scale mining and its socio-economic impact in developing countries". This paper tried to examined the positive and negative impact of small-scale mining in developing country. This study told that small scale mining plays a vital role in poverty irradiation in the developing world, and significantly contribute to country revenues and foreign exchange earnings. It provides employment for cut back workers from large-scale mines, which increased income levels, raised standard of living, and minimized rural-urban drift and helped in lower crime and suicide rates. Small-scale mining creates opportunities for women in developing countries. But small-scale mining also has negative impacts which includes adverse impact on environment, health and safety of workers.

Hasan et al. (2015) conducted a study on "Environmental impacts of coal mine and thermal power plant to the surroundings of Barapukuria, Dinajpur, Bangladesh". The main aim of the study is to examine the impacts coal-based thermal power plant & coal mines on the environment of study area. The samples were collected from the study area in 2014 for sampling. The finding of the study reveals that power plant & coal mines have number of environmental and socio-economic challenges including soil, water, sound and air pollution; fly ash and waste; subsidence of land, etc. which cause many damaging effects to both the natural and human environments. But it is not possible to stop the coal mining because coal is an important source of energy, but it may be possible to minimize the dangerous effect of effects of coal mining. Therefore, a harmony needs to be maintained between environmental pollution & development as well as safety of physical and social environments and different measures should be taken to control and mitigate the negative impacts of coal mining and coal-based thermal power generation.

Mishra (2009) in his article "Coal Mining and Rural Livelihoods: A Case Of Ib Valley Coalfield, Odisha" highlights the positive and negative impacts that mining has on the livelihoods of the local communities in the IB valley coalfield, using structured questionnaire and systematic sampling method, the Herfindahl index has been used and T-test used to compare two groups. Coal mining in IB valley coalfield helps in development of Odisha economy but it has negative effect on the air, water and noise pollution; on health and on agricultural production and displacement which affect the rural community. Lastly, this study suggests that the govt. should introducing new technique of mining to minimizing the environmental loss.
Aryee (2000) had organised a study on "Ghana's mining sector: its contribution to the national economy. This study explained the contribution of mining in national economy by analyse the survey data of 16 large scale mining operate in Ghana by end of 1998. The result reveals that mining sector plays an important role in development of an economy because it is the major contributor of revenue generation.
Panda (2014) conducted a study on "Mining Sector and Its Impact on Odisha Economy: Proper Utilization of Limited Resources using Forecasting Techniques" and attempt to show the economic significance of mining sector in terms of revenue generation and value of total mineral extraction. Secondary data used in this study. This study found that contribution of mining sector in terms of revenue generation is insignificance because of corruption in large-scale mining.
Randive et.al. (2017) conducted a study on **"**National Mineral Policy and Its Impact on Indian Mineral Sector" and This paper provides a historical perspective and advancement of different policies to identify the strengths and weaknesses of the legal framework for mining. This study found that the economy before making of policies and legislations for mineral sector shows signs of weakening on account of low investment, an adverse internal environment and cutback in production by manufacturing industries due to foreign exchange shortages. The reform in National Mineral policy and ultimately in mineral sector in response to both global and national pressures ensure the economic growth of the country. The inflows of FDI and private investment due to implementation of National Mineral Policy help in growth of mining sector.

RESEARCH GAP

From above review of literature, found that most of the study done on impact of mining sector on environment and health population and contribution of mining towards national GDP. And I found only one study on impact of National Mineral policy on mining sector of India. But I do not come across a single Study made in Odisha regarding mineral policy impact or effectiveness of mineral policy. Therefore, this study tries to fill this gap by examining the impact of mineral policy on mining sector in Odisha

OBJECTIVE:

To examine the impact of mineral policy on mining sector in Odisha in terms of mineral production, revenue generation and employment creation.

RESEARCH METHODOLOGY

This study is based on secondary data. Secondary data are collected from different sources such as Director of Mines, Odisha; Odisha Economic Survey; Department of Steel & Mines**.** MS Excel was used to calculate (CAGR and AGR), making graphs, figures and tables.

RESULTS AND ANALYSIS

National Mineral Policy

The National Mineral Policy (NMP) is necessary to guide the government on policy issues. The policy constitutes a formal framework through an extensive consultation process to develop mineral sector within the national strategy to overcome the major barriers in the mineral sector, contribute significantly to its national social and economic growth and maximize the economic and social benefits of mineral exploration. It presents the objectives, strategies, research and development and fiscal aspects, which are aimed at creating favourable environment to regularize mining activities and mineral sector and progressively contribute towards national development. First NMP came into effect in 1993, which was modified in 2008. Further mineral policy came in 2016, then in 2019.

1. National Mineral policy, 1993

The NMP was first formulated in 1993 with an aim to liberalize the mining sector. The NMP-1993 was intended to create an environment to encourage the private investment and introduction of state-of-the-art technology in exploration. The policy stressed the formulation of legal measures for the regulation of mines and development of mineral resources, which ensures the basic uniformity in mineral administration. The main thrust of the policy was to develop mineral resources in consideration with the national and strategic position to ensure their adequate supply and to meet present and future demands. It stimulates necessary links for the even development of mineral sector and to create conducive economic environment (Ministry of Mines, 1993).

2. National Mineral policy, 2008

The NMP-1993 for 'non-fuel' and 'non-coal' minerals amended in 2008 had its primary objective of achieving zero waste mining and ensuring technology up-gradation for development of domestic mineral resources. This policy was a blueprint for large scale privatisation and Foreign Direct Investment (FDI) in mining. It was the pretext for a series of measures in succeeding years to open up the sector to the private sector and FDI. NMP-2008 emphasized the need to develop a Sustainable Development Framework (SDF) as recommended by the High-level Committee (Hoda Committee) in the context of India's mining environment for optimum utilisation of the country's natural mineral resources.

3. National Mineral policy, 2016

The necessity for the formulation of new National Mineral Exploration Policy (NMEP) was that, the mineral sector was facing the challenges posed by increasing demand and shrinking mineral resources world over. Although the existing regulations and institutions needs reform to deliver better results on the ground for sustainable mining future, balancing the needs of the people, the environment and the economy were equally important factors. A Sustainable Development Framework for Indian mining sector was developed in 2011 in an attempt to position the sector in the framework of sustainability; considering economic, environmental and social aspects. In the light of recent political and environmental changes, India had advanced the mineral policy framework by introducing NELP, which has major emphasis on the exploration strategies.

4. National Mineral policy, 2019

National Mineral Policy 2019 aims to bring better regulation that can help in improved sustainable mining sector development. It also aims to bring transparent and balanced enforcement that helps the people (focus on the population of tribal areas) who get affected by mining projects. Main features of NMP 2019 are Increase exploration activities with increased participation from the private sector, Maximize the sectoral contribution to the Indian Economy and Reduce Imports.

PRODUCTION SCENARIO OF MINERALS IN ODISHA AFTER IMPLEMENTATION OF NATIONAL MINERAL POLICY

Odisha act as a leader in the production of minerals such as iron ore, coal, and bauxite, as well as the country's only producer of chromite, contributing 34.3 percent of the country's total mineral production. The state is rich in a wide range of minerals and hence plays an important role in the mineral map of the country. The following table shows the production of mineral after national mineral policy came.

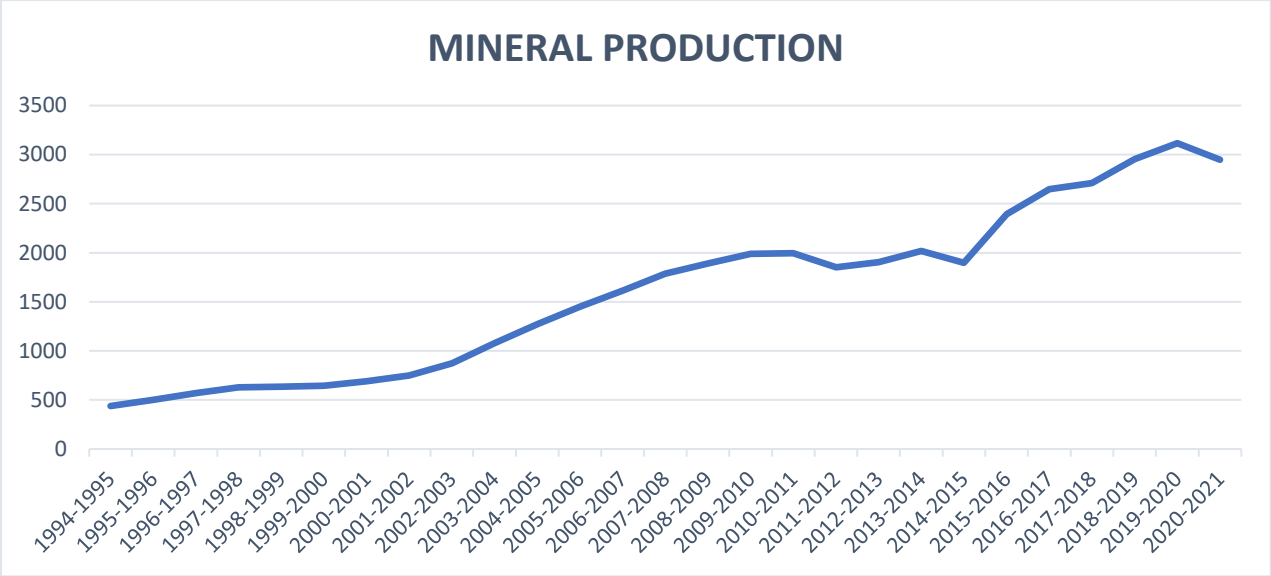
Table 1: Year-Wise Production of Major Minerals in Odisha (Quantity in lakh MT)

Years	Mineral Production (Quantity in lakh MT)
1994-95	438.34
1995-96	499.99
1996-97	569.04
1997-98	626.89
1998-99	635.28
1999-20	645.8
2000-01	689.25
2001-02	749.82
2002-03	873.5
2003-04	1080.3
2004-05	1270.5
2005-06	1449.67
2006-07	1614.52
2007-08	1785.82
2008-09	1890.95
2009-10	1989.54
2010-11	1995.46
2011-12	1852.20
2012-13	1902.94
2013-14	2018.17
2014-15	1898.33
2015-16	2394.46
2016-17	2648.74
2017-18	2708.35
2018-19	2954.56
2019-20	3116.4
2020-21	2947.91

Source: Director of Mines, Odisha

The First National mineral policy Came in 1993, after implementation of mineral policy there is continuously increase in production of minerals. In 1994 Odisha produce 438.34 MT mineral in 1994-95, 499.99 MT in 1995-96, 569.04 MT in 1996-97 and it continue to increases and it reach at 2947.91 MT in 2020-21. As shown in following figure in-between 2011 & 2017, there was small fluctuation because of closure of some mining leases in the state. After that the production again increases.

Figure 1: Trend of Mineral Production



Source: Director of Mines, Odisha

REVENUE GENERATION IN ODISHA FROM MINING

Odisha is a mineral-rich state, and its mineral resources contribute to the state's economic development in a variety of ways. Its contribution to the GSDP is critical to the economy's development. From following figures, we can see that there are continuously increases in revenue. Initially after implementation of first mineral policy in 1993, revenue increases but at a slow rate, after 2008 there is increase in revenue at a faster rate because in 2008 modified policy came. Then again in-between 2011 & 2017 there was some fluctuation because of revelation of corruption and closure of some mining leases in the state. After 2017 again revenue start increases.

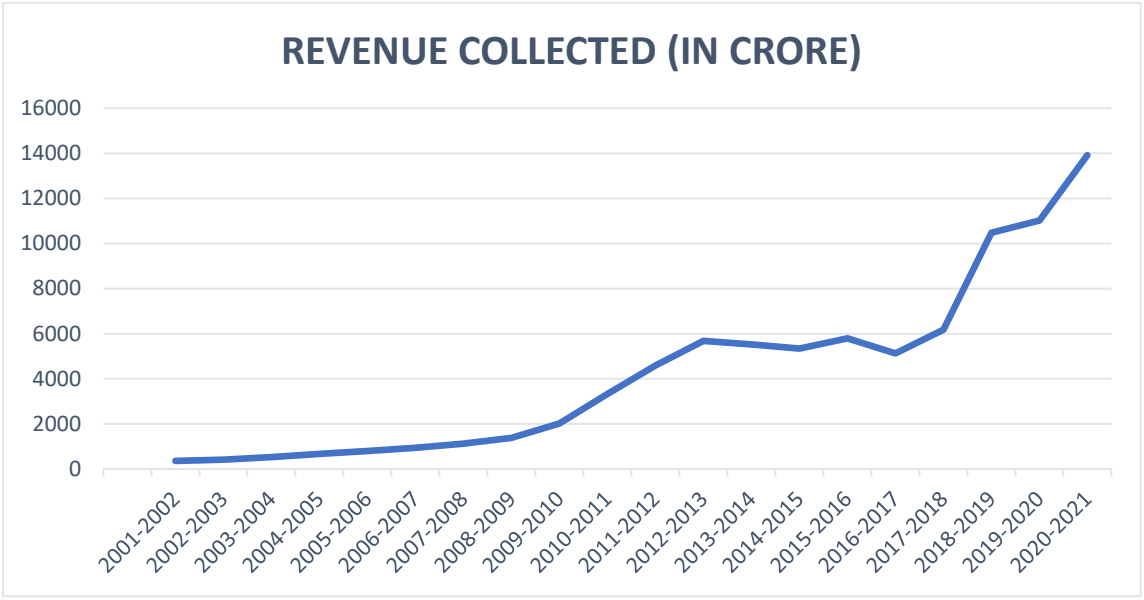
Table 2: Revenue Collection from Minerals

Year	Revenue Collected (In Crore)
2001-02	360
2002-03	422
2003-04	532
2004-05	670
2005-06	805
2006-07	936.55
2007-08	1126.09
2008-09	1380.59
2009-10	2020.72
2010-11	3330.47
2011-12	4586.65
2012-13	5679.35

2013-14	5519.58
2014-15	5335.05
2015-16	5797.97
2016-17	5134.82
2017-18	6176.91
2018-19	10479.12
2019-20	11019.86
2020-21	13918.19

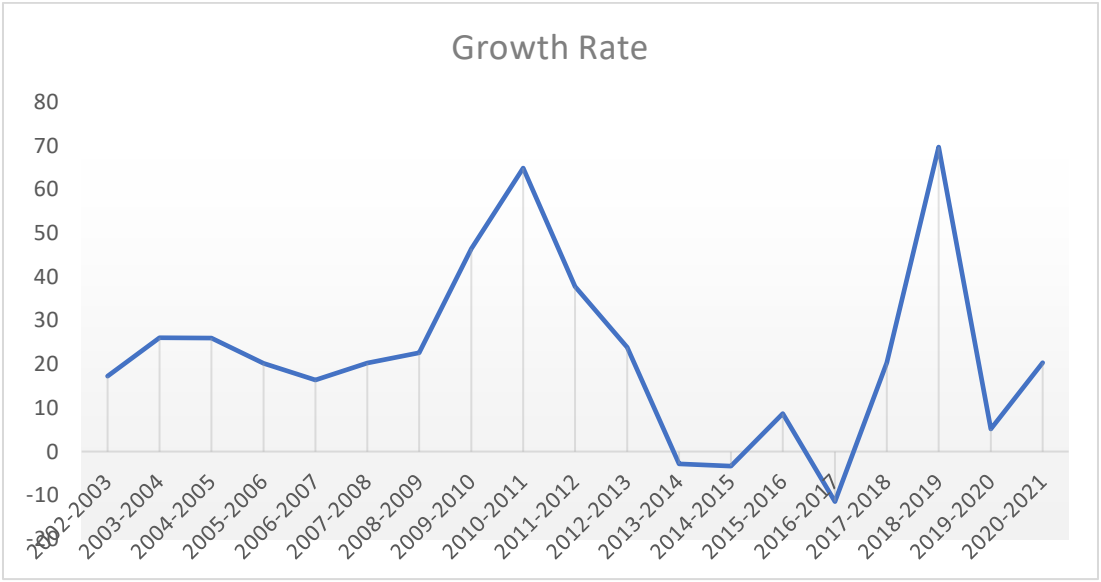
Source: Department of Steel & Mines, Government of Odisha

Figure 2: Trend of Revenue generation (Absolute Value)



Source: Department of Steel & Mines, Government of Odisha

Figure 3: Growth Trend of Revenue Generation



Source: Department of Steel & Mines, Government of Odisha

The above figure indicates that the initially growth rate of revenue is at peak in the year of 2010-11 after that it started declining because of the revelation of corruption cases, leading to closure of some mining leases in the state. In 2017 mining leases started again and give the highest revenue in the year of 2018-2019 but after that again decrease due to covid pandemic.

IMPACT OF MINERAL POLICY ON EMPLOYMENT GENERATION

The level of employment is an essential indicator of a country's economic development. The efficiency of a given sector in an economy is measured, among other things, by its ability to generate jobs. Different segments of the population are employed by mining. The mining belt's indigenous and underprivileged inhabitants benefit greatly from the sector's employment opportunities. According to the table below, roughly 59,636 workers were directly employed in significant mineral activities by the end of 2019-20. On the same basis, coal mining employs the most workers (22,700), followed by iron ore (19,850), chromite (7,010 workers), and manganese (4,215 people) (Odisha economy survey, 2020-21).

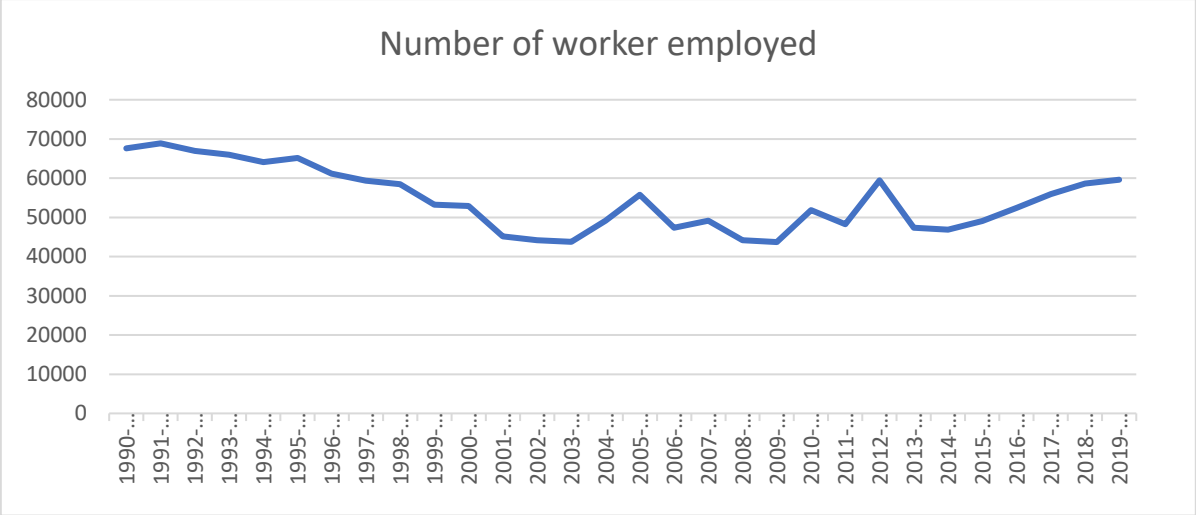
Table 4: Number of Workers Directly Employed in Major Mineral Activities

Years	Numbers of Workers Directly Employed	Annual Growth Rate
1990-91	67596	-
1991-92	68886	1.91
1992-93	66927	-2.84
1993-94	65951	-1.46
1994-95	64094	-2.82
1995-96	65147	1.64
1996-97	61192	-6.07
1997-98	59326	-3.05
1998-99	58448	-1.48
1999-20	53209	-8.96
2000-01	52937	-0.51
2001-02	45135	-14.74
2002-03	44167	-2.14
2003-04	43743	-0.96
2004-05	49176	12.42
2005-06	55764	13.40
2006-07	47376	-15.04
2007-08	49176	3.80
2008-09	44167	-10.19
2009-10	43705	-1.05
2010-11	51877	18.70
2011-12	48239	-7.01
2012-13	59417	23.17
2013-14	47370	-20.28
2014-15	46876	-1.04

2015-16	49086	4.71
2016-17	52405	6.76
2017-18	55940	6.75
2018-19	58600	4.76
2019-20	59636	1.77

Source: Odisha Economy Survey

Figure 3: Number of Workers Directly Employed in Major Mineral Activities



Source: Source: Odisha Economy Survey

From the above figure it is clearly visible that there is continuously decline in employment after mineral policy implementation because mineral policy suggests labour-saving technique in mining.

CONCLUSION

Mining is one of the core sectors that drive the growth of an economy. Mineral Policy Plays a crucial role in the growth of mining sector. If the government emphasized on mineral policy properly then it would be definitively beneficial for growth of mining sector as well as economy of a state or country. From the above analysis I found that implementation of mineral policy helped to some extent in growth of mining sector in terms of mineral production and revenue generation. But it is not that much effective for creating employment in mining sector. Because mineral policy emphasized on capital intensive mining or labor-saving mining. In general, we can say that National mineral Policy has positive impact mining sector as well as growth of an economy. Therefore, government should be emphasized on Mineral policy.

Conflict of interest

The authors have no conflict of interest to declare.

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