

Impact of Foreign Direct Investment on Mining Sector

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Abstract: Foreign Direct Investment (FDI) in mining provides various growth opportunities for economy, environment and society. Indian economy is rich in mineral resources. More FDI implies for more finance for more usage of land and more extraction. Mining sector is extracting different material which affects land's efficiency, hence levying more impact on environment. Various minerals are produced in India which includes 95 minerals these minerals are metallic, non-metallic, atomic, fuel-related minerals and other minor minerals. This paper focuses on FDI's impact on mining sector. The present study attempts to focus on the objectives relating to economy, environmental and social impact. The significance of FDI in mining sector is studied in which growth of demand, competitive advantages, policy support and various attractive opportunities, economic aspect, environmental aspect and social impact aspects are included. The miners' are affected with health diseases. Humans and animals may affect by landslides and floods. So the paper focuses on impact of FDI in mining sector.

Keywords: Foreign Direct Investment, Mining, Economic impact, Environmental impact and Social impact.

1. INTRODUCTION

Mining sector received boost post independence under the impact of successive 5 Year Plans. Indian mining sector was opened for Foreign Direct Investment (FDI) in 1993 after the New Mineral Policy. In case of minerals, Odisha was the leading producer in Financial Year 2018, followed by Rajasthan, Chhattisgarh, Karnataka and Maharashtra with production of minerals worth US\$ 3.12 billion, US\$ 1.17 billion, US\$ 1.42 billion, US\$ 1.27 billion, US\$ 0.19 billion and US\$ 1.17 billion. Production of metallic minerals has increased from US\$ 7.30 billion in 2011-12 to US\$ 8.23 billion in 2017-18. During the same period, production of non-metallic minerals increased from US\$ 0.95 billion to US\$ 1.20 billion. India is expected to overtake Japan to become the world's second largest steel producer by 2019-20 (IBEF, Annual report 2019).

According to World Steel Association, "India's steel demand is expected to grow 5.5 per cent in 2018 to 92.0 million tonnes and 6.0 per cent in 2019 to reach 97.5 million tonnes". Mining industry is an important segment in India which largely contributes to Indian economy. According to the UNCTAD Investment Trends Monitor 2018, "India was the 10th largest recipient of global FDI in 2017". Foreign Direct Investment in India has created some wonderful opportunities in the country in terms of creating employment and improving the basic infrastructure of the country. India is among one of the few markets in the world that offers such high prospects of growth and earning in virtually all sectors of the economy. The expansion in FDI to India leads rapid economic growth and increasing links to the rest of the world. Foreign Investment in India has huge potentials. However, foreign investment in India provides various advantages and disadvantages. Investors prepare themselves well in advance to face with adversities. Some of the drawbacks that investors may have to face are bureaucratic hassles, infrastructural deficiencies, power shortages and sometimes political uncertainty. The paper focuses on the significance of FDI in mining sector in which growth of demand; competitive advantages; policy support; and various attractive opportunities are studied. Secondly, the study focuses on impact of FDI in mining sector in economic aspect. In this aspect FDI inflows in India in mining sector and number of mines will be studied. Thirdly environmental impact is studied in which impact on Air, land and water is studied. Lastly, social impact of FDI in mining sector is studied in this research paper in which health affects due to mining is studied. In this part miners' health, animals and plants are targeted. The miners' may affected with some health diseases like skin diseases, asbestosis, silicosis, or black lung disease. Humans may affected by the occurrence of landslides and floods. Animals and plants can be poisoned directly by mining. So this paper also focuses on impact of FDI in mining sector. The paper attempts to study impact of FDI in mining sector on economy, environment and society i.e. land, air water, animals' health, human health and plants health.

2. LITERATURE REVIEW

Asiedu (2002) focused on FDI determinants in Africa's development. FDI inflow has been critical because of its potential and actual benefits to growth, employment generation, technological know-how, enhanced efficiency and competitiveness, supplements to domestic savings and integration into the global economy.

Lee and Hana (2013) studied 19 OECD countries and CO₂ emission. The effects of CO₂ emissions on GDP by using a dynamic model for panel data from 19 OECD countries investigated. The results indicate a significant decline in the dependence of economic growth on pollution, suggesting technological progress toward economic growth with less pollution and providing empirical support indirectly for the Environmental Kuznets Curve (EKC) hypothesis.

Dong, et.al, (2012) focused on increasing foreign direct investment (FDI) flows in environmental protection. More investors tend to relocate industries which generate more pollution. In case of greenhouse gases (GHG), when pollutant is transboundary, the incentives to source country to relocate and the recipient country's willingness to host such type of industries may be doubtful or conflicted. North market share game model used to study the relationship between FDI and environmental regulation. Contrary to the pollution haven hypothesis, the model showed the emission standard will rise if market size of the two countries is small, and it will less affect if market sizes are large.

Henderson and Millimet (2002) examined utilization of state-level panel data on inflows of FDI along with an innovative measure of relative pollution abatement costs so that the impact of environmental stringency on capital flows can be assessed. Standard parametric panel data models used in the study. The study resulted that capital flows are sensitive to abatement costs. By using nonparametric methods the study found that the results were not significant and there was no significant impact of relative abatement costs across different states under study as suggested by the parametric approach.

Nasrollahi, et al., (2014) focused on accelerating environmental degradation such as greenhouse gas (GHG) emissions, deforestation and loss of biodiversity. The paper tested pollution haven hypothesis in which FDI inflows in five Asian countries for the period from 1990 to 2011 studied. Results showed support to the idea that investors favor lax environmental regulation when making FDI location decisions and also suggest the validity of Environmental Kuznets Curve (EKC) hypothesis.

Arora, N (2014) studied positive benefits of FDI to host country. These benefits include skills, technology transfer, market access, export promotion. It also showed some negative impacts on mining sector due to FDI. The study showed that economic progresses depend upon mineral industry. The study examined environmental impacts of FDI on mining sector. The study resulted that there must be control on transportation, processing and consumption at initial stage so that negative impact can be stopped and there must be proper handling of waste dumps of mining.

Rutaiwa and Simwela (2012) focused on Tanzania's export capacity during 1989-2009. It worked on role of FDI on Mining sector. The study used analytical technique; Ordinary Least Square which resulted that relation of total export performance with rest of the world is negative which states FDI's contribution have been weakly and it also stated that exerting negative pressure on Tanzania's export performance over the period. The result between Tanzania export performance and FDI relationship is not significant which confirms the hypothesis of the positive relationship among the variables. The study founded that when investments are made, the benefits from transformation of mining do not turn up within short period.

Chin (2016) studied contribution of Foreign Direct Investment (FDI) to Guinea's mining sector. The relationship among different variables, effects and a way to effect is tested by using Granger causality test. Variables such as GDP, government income, trade, FDI inflows and exchange rates are taken as variables for testing purpose. This test produced evidence of a bidirectional casualty relationship which states that influence of FDI on efficiency is dependent on the government relaxations provided to the mining sector for enhancing economic growth.

Acharyya (2009) examined benefits and costs of foreign direct investment in the Indian context which are GDP growth and the environment degradation. The study focused on the period 1980-2003. The study found a long run positive, but marginal impact of FDI inflow on GDP growth in India. In long run growth impact, FDI inflow on CO₂ emissions is very large. The actual impact was due to CO₂ emission. It happened because CO₂ emission is one of the many pollutants generated by economic activities. CO₂ is a global air pollutant so finding has some far reaching implications for the global environment as well, with India having emerged as the fourth highest in the global ranking of CO₂ emissions by turn of this century.

Gillmore, et al., (2013) analyzed measurable levels of geogenic trace metals, metalloids and anthropogenic chemicals. This study focused on surrounding sediments. Abandoned mining sites in hyperarid climates have not been the focused on wet and temperate areas. Research has focused on historical mining sites in semiarid and wetter regions of United States, South Pacific and Europe. These are risks associated areas including aqueous phase mobilization as a result of abundant precipitation. However, many mining areas in the American Southwest and aboard are located in hyperacid regions and viewed as not having a potential for mobilization of contaminants. The results found that mining activities affects the mobilization of geogenic metals and the surrounding environment. Furthermore, trace metals have the focus of interest due to their long residence times and significant toxicities to biota in wet climates.

3. RESEARCH METHODOLOGY

The present study is exploratory in nature. The secondary sources of data are reports, journals, magazines, newspaper and internet. Data has been taken for 8 years from 2010-11 to 2017-18 from data.gov.in website. In third objective, environmental impact is focused in which impact of more FDI on environment is studied. It shows impact on Air, land and water. The last objective focuses on social impact in which impact on animals, human and plants due to accidents, floods and other reasons are studied.

3.1 Sources of Data Collection

To achieve objectives of the study, secondary data has been used which is taken from various different sources such as UNCTAD, OECD, RBI's website, IBEF, publications and various research papers. Graphs are used to represent FDI inflows and number of reporting mines from 2010-11 to 2017-18. Upward and downward trends are analyzed to study economic impact.

3.2 Objectives

This study takes a closer look at Foreign Direct Investments inflows to India and number of reporting mines in India. The paper attempts to achieve following objectives:

- i. To study the significance of FDI in mining sector especially growth of demand, competitive advantages, policy support and various attractive opportunities.
- ii. To study impact of FDI in mining sector in economic aspect in which FDI inflows in India in mining sector and number of mines are studied.
- iii. To study environmental impact of mining sector on Air, land and water.
- iv. To study social impact of FDI in mining sector on animals, human and plants due to mining is studied.

3.3 Limitations of the Study

Economic impact of FDI on mining sector is not only based on FDI inflows and number of mines. So this study is limited to only two aspects for economic impact. So measurement of economic impact is not possible only through FDI inflows and number of reporting mines. Data is collected from limited secondary resources only and accuracy of results is based on validity of information.

4. DATA ANALYSIS

This section of paper includes significance of FDI in mining sector, Impact of FDI in different aspects such as economical impact, environmental impact and social impact.

4.1 Importance of FDI in Mining Sector

The mining industry is vital segment in India which contributes to growth of Indian economy. There are various mineral resources in India which plays important role in the industrial development of India. FDI Inflows has been permitted up to 100 per cent through automatic route in the mining industry in India. It provides huge benefits to Indian economy which are presented below:

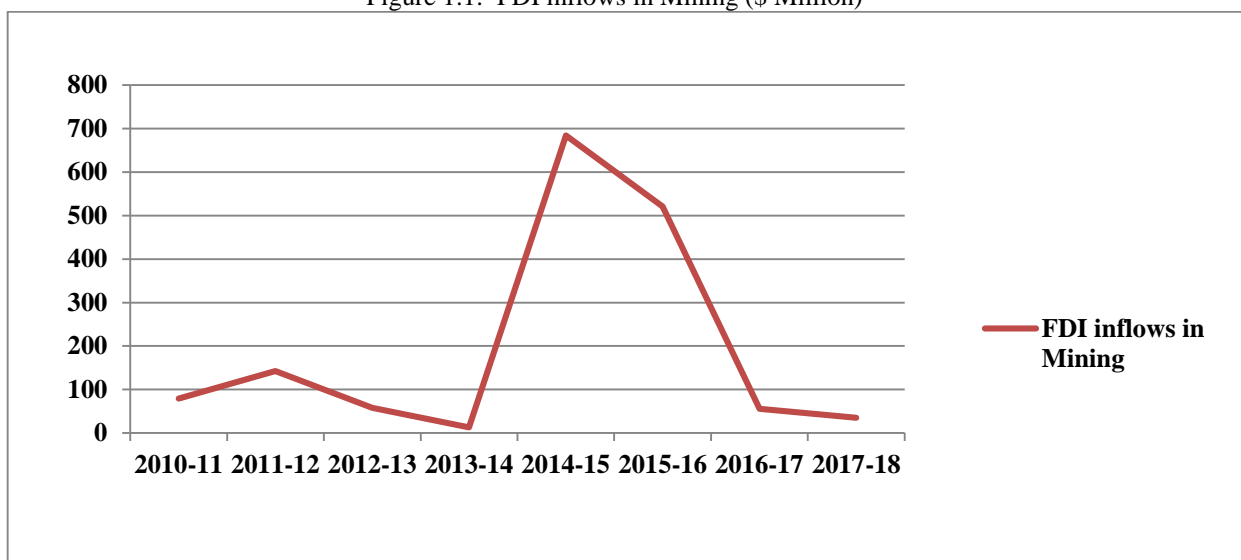
- i. Growth of Demand: Due to more FDI, there is more growth in infrastructure, production, power; cement industries iron steel industries and building in mining sector. Due to more construction of buildings and more expectations by customers, there is more demand for iron and steel.
- ii. Competitive advantages: India holds a particular position in conversion cost in steel and alumina. It also provides advantage in cost of production. Its strategic location enables convenient exports to develop as well as the fast-developing Asian markets. 95 minerals are produced in India which includes– metallic, non-metallic, atomic; fuel related minerals and minor minerals are included. (IBEF, annual report, 2019).
- iii. Attractive opportunities: There are various attractive opportunities in mining sector such as in iron ore, coal and bauxite. To discover sub-surface deposits, different opportunities are available in mining sector. The Ministry of Steel aims to increase the steel production capacity to 300 million tonnes by 2030-31 from 134.6 million tonnes in 2017-2018. By March 2019, auction is expected of 105 mineral blocks. (IBEF, annual report, 2019).
- iv. Policy support: 100 percent FDI is allowed through automatic route in mining sector. MMDR Bill (2011) is approved so that better legislative environment for investment and technology can be provided. Under the Union Budget 2018-19, the Government added a surcharge of 10 per cent on aggregate duties of customs on imported goods to strengthen the domestic industry (IBEF, annual report, 2019).
- v. Others: More FDI provides more advantages to economy such as capital, skill and technology, export promotion and market access. So FDI has gained huge importance in development of the country in social, economical and environmental growth.

4.2 Impact of FDI on Mining

FDI in mining sector plays an important role in economic, environment and social impact. In this part of the study, firstly the economic part is shown in which FDI inflows and numbers of reporting mines are analyzed. Secondly the environmental aspect is presented in which impact on air, land and water is studied and in last part, social aspect is presented in which impact is studied on human, animals and plants' health is studied.

4.2.1 Economic Impact: This aspect is studied with help of FDI inflows in mining sector and number of reporting mines in India. Figure 1.1 represents FDI inflows and figure 1.2 represents number of reporting mines in India from 2010-11 to 2017-18. There are more variations in FDI inflows in mining sector of India. As shown in figure 1.1 FDI in 2010-11 was near about \$80 Million which reduced to \$12.7 Million in 2013-14. There is sharp rise in FDI inflows in 2014-15 which touches to approx. \$684 million. After it, FDI inflows reduced to \$35 Million. Such variations affect economy in positive or negative way.

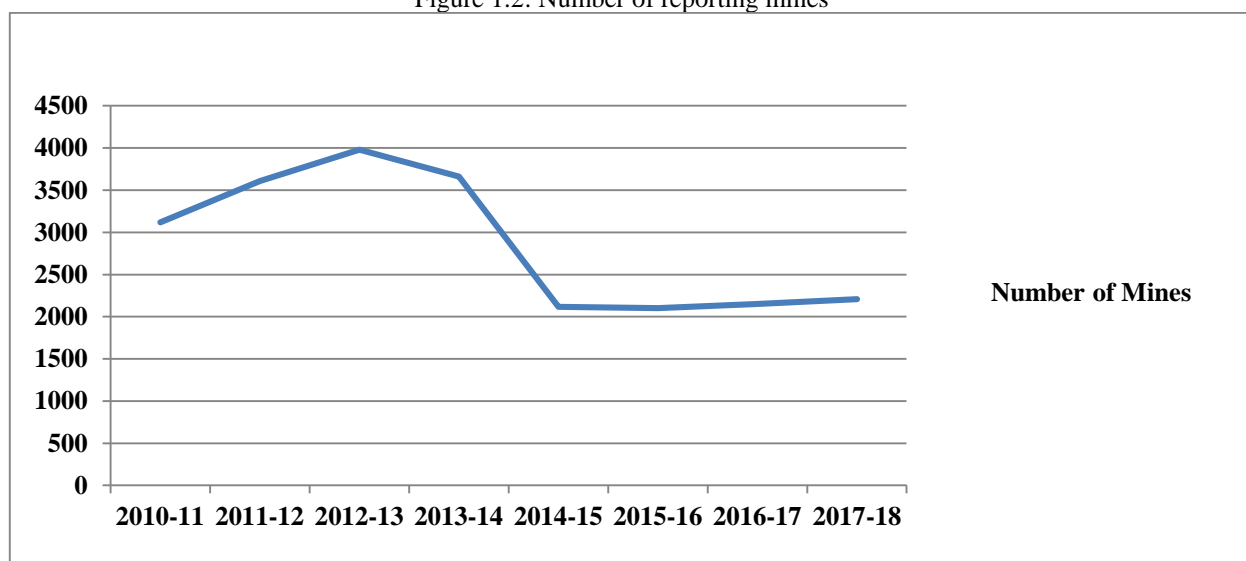
Figure 1.1: FDI inflows in Mining (\$ Million)



Source: [https://data.gov.in/resources/financial-year-wise-fdi-equity-inflows-2000-01 to 2017-18](https://data.gov.in/resources/financial-year-wise-fdi-equity-inflows-2000-01-to-2017-18).

There are some factors which are responsible for this sharp rise in FDI inflows in 2014-15. In 2013-14, there is sharp rise in inflows which fall in next financial year. Government has approved 100 per cent FDI rough automatic route in mining sector except fuel minerals, atomic minerals and precious stones like diamonds. The inflows have not caught up with boom in other sectors such as communication & financial services and retail & wholesale trade. In annual report of 2016, the country was projected as a strong investment destination by RBI. It was driven by consumption demand and momentum which was gained by the manufacturing sector. The country received \$35 million approx. capital inflow in the last fiscal year, marginally higher than \$35 million approx. in 2017. According to the UNCTAD Investment Trends Monitor 2018, “India was the 10th largest recipient of global FDI in 2017”. According to mining industry it happened due to lack of investments in mineral exploration and lack of exploration policies for foreign investors. Only one per cent of India’s Obvious Geological Potential has been converted into mineable assets. It is happened due to poor scale of exploration and inadequate funds and better exploration policies which showed that the country has been lacked to become favored destination for global explorers. (Article, Business Standard, 2018). Figure 1.2 shows number of reporting mines which includes total mines including fuel, metallic and non metallic mines. Number of reporting mines are 3118 in 2010-11 which increases to 3978 in 2012-13. After that there is downfall in number of reporting mines till 2014-15 to 2117 and then there is stability till 2017-18 to 2200 approx.

Figure 1.2: Number of reporting mines



Source: [https://data.gov.in/resources/number-reporting-mines-india-2010-11 to 2017-18](https://data.gov.in/resources/number-reporting-mines-india-2010-11-to-2017-18).

As shown in figure 1.1 and 1.2, there is rise in FDI inflows and number of reporting mines in 2010-11 to 2011-12. There is downfall in 2013-14 in both figures. In 2014-15 there is stability in number of reporting mines but there is sharp rise in FDI inflows to \$684 million. Then FDI inflows came down to \$55 million approx. in 2016-17 and after that FDI inflows and number of reporting mines get stability.

India is the 3rd largest producer of coal. India is the 3rd largest producer of coal. 95 minerals are produced in India which includes– metallic, non-metallic, atomic, fuel related minerals and minor minerals included.

In annual report, India's production in mining is at wonderful position such as 689 million tonnes the production in coal in 2018. In crude steel production, India got third position in 2017. Production of crude steel increased 4.5 per cent from 97.39 million tonnes to 102.34 million tonnes in 2018. India gets 4th position in iron ore production. In 2018, production of iron ore reached to 210 million tonnes (IBEF, Annual report 2019). FDI inflows and number of mines in fuel are increasing in 2010-11 to 2011-12 mines are increasing till 2012-13 but FDI inflows falls down to 2013-14. After that there is sharp jump in FDI inflows to 685 million approx. and which falls to 35 million in 2017-18. Number of mines also falls in 2015-16. So there are both upward and downward trend in FDI inflows and number of reporting mines.

4.2.2 Environmental Impact

- i. **Water:** Large amount of water is required for various purposes in mining processes. These processes may be mine drainage, mine cooling, aqueous extraction and other mining processes which increase the potential to contaminate ground and surface water. In well-regulated mines, hydrologists and geologists take various measurements of water and soil to exclude water contamination that could be caused by the mine's operations. Mining throws sulphide into air which becomes pollutant when it proceeds with air and react with water to form sulphuric acid. Water in the mine containing dissolved heavy metals such as lead and cadmium leaked into local groundwater, which contaminates ground water. Long-term storage of tailings and dust can lead to additional problems, as they can be easily blown off by wind.
- ii. **Air:** Mines may produce dust from blasting operations. These operations generate many dangerous gasses which pollutes air. During smelting operations, enormous quantities of air pollutants, such as the suspended particulate matter, SO₂, arsenic particles and cadmium, are emitted. Metals are usually emitted into the air as particulates.
- iii. **Land:** Most of the plants have a low concentration tolerance for metals in the soil, but sensitivity differs among species. Grass diversity and total cover is less affected by high contaminant concentration than forbs and shrubs. Plants can be affected through direct poisoning. Root exploration is reduced in contaminated areas compared to non-polluted ones. Cultivated crops might be a problem near mines. Most crops can grow on weakly contaminated sites, but yield is lower than it would have been in regular growing conditions. Sand Mining and gravel mining creates large pits and fissures in the earth's surface. At times, mining can extend so deeply that it affects ground water, springs, underground wells, and water table.

4.2.3 Social Impact

Employment opportunities have increased with more FDI but it has negative impact on health. There are also many occupational health hazards. Most of the miners suffer from various respiratory and skin diseases. Miners working in different types of mines suffer from asbestosis, silicosis, or black lung disease. Humans are affected by the occurrence of landslides and floods. Animals can be poisoned by mining due to Bioaccumulation in which plants or the smaller organisms due to eating process may lead to poisoning: horses, goats and sheep are exposed in certain areas to potentially toxic concentration of copper and lead in grass.

5. SUGGESTIONS & RECOMMENDATIONS

Such types of policies must be framed out so that benefits of more demand and competition can be taken. These policies must be supporting to mining sector and economic environment so that more inflows can be favorable for more growth of mining sector and economy.

Environment stringent policy must be strictly followed so that environment can be protected from wrongdoers. If there is any non compliance which affect environment that non compliance must be punishable.

Miners' must know effects of mining on humans and plants. They must have more knowledge and experience so that more unfavorable intervention in environment and society can be barred and development of society and mankind can be ensured.

6. CONCLUSION

FDI is taken as an apparatus to complement earnings of the domestic country, to attain higher degree of growth and advancement. FDI assists the home country not only by providing employment opportunities to the people but also by providing certain benefits such as by up gradation of the technological skills, by providing accessibility to global managerial skills, by ensuring optimum utilization of human, by enabling Indian Industry to become more efficient and competitive.

There are various natural resources in the country. Indian land is very fertile but use of heavy machines for extraction purpose is not fair for land. Economic aspect of FDI in mining helps in increasing production, skills and employment opportunities which helps in growth of economy. But environment and social aspect has not put more positive effect. Land, air and water affected more because it causes deforestation, Sulphuric acid, dangerous particulates and also affects species living in water. From social aspect, more FDI provides more employment opportunities but sometimes due to flood or landslides, human health, plants and other organisms affected. Thus, FDI in mining have economic, environmental and also social impact. It has positively affect economy but its negative effect on environment cannot be ignored. Although aiming to provide a relevant imagine, there are some limitations generated by the research methodology and character, as well as by the dimension of secondary data. Thus, the

study may generate scope for further research based on complementary methodology and related topics of Impact of FDI in mining sector.

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