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SIGNIFICANCE OF MINING SECTOR AS ENGINE FOR ECONOMIC GROWTH AND SOCIAL DEVELOPMENT: RELEVANCE TO INDIA COAL INDUSTRY

Rajesh Kumar Shukla[1] and Sanjay Kumar Singh [2]

[1]Asstt. Professor, Department of Commerce. C.M.D. College, Bilaspur, (C.G.)
[2]Sr. Manager (Mining)/Area Planning Officer, at S.E.C.L./Research Scholar .

Abstract:-India is well endowed in terms of most minerals. The country produces as many as 87 minerals, including 4 fuel minerals, 10 metallic minerals, 47 non-metallic minerals, 3 atomic minerals and 23 minor minerals (including building and other materials). The Mineral Development and mining sector is a significant contributor to the India's GDP growth; as there is a strong correlation between growth in same and the manufacturing sector; making it a catalyst for the growth of basic industries such as power, steel, cement etc.

The National Mineral Policy, 2008 differed from the earlier policy by introducing an open sky policy on non-exclusivity for reconnaissance work, large area prospecting license, seamless transfer and security of tenure to the entrepreneurs. Government of India liberalized the grant of licenses and leases for most of the minerals except atomic minerals and Hydrocarbon energy minerals under the National Mineral Policy, 1993. However, the sector has witnessed negative growth for two consecutive years now. In 2011-12, the growth outlook had turned negative to register a minus 0.6% contraction. In 2012-13 too there was no significant improvement, and the sector contracted by 0.6%. This de-growth is having its repercussions on the economy as a whole and is contributing to the widening current account deficit and resultant weakness in Indian currency. Since coal has to continue to play a critical role in supporting India's energy plans for considerable time into the future, coal mining and coal usage should become more environment friendly. India needs an evolving and growth oriented mineral development and mining policy that can foster systematic and sustainable growth in the sector.

This paper advocating that the coal industry as engine for economic growth and social development trends in India. Treating economic growth with sustainable manner in the coal mining industry means that investment in coal projects should be financially profitable, technically appropriate, environmentally sound and socially responsible to community. Such strategic approaches are necessary in order to achieve economic, social and environmental sustainability. Authors present this paper in Indian context for contribution of coal mining industry.

Keywords: Economic Growth , Social Development , India Coal Industry , International Organizing Committee .

INTRODUCTION

India has long been recognized as a nation well endowed in natural mineral resources. India ranked forth amongst the mineral producer countries, behind China, United States and Russia, on the basis of volume of production, as per the Report on Mineral Production by International Organizing Committee for the World Mining Congress, It however ranked eight on the basis of value of Mineral production, during 2009.

The Mining sector therefore is one of the important sectors in India's economy and contributes about 2% to

our GDP. However the contribution of the sector to India's GDP has been on the decline. The mining sector contributed 3.4% of India's GDP in 1992-93. This declined to 3.0% in 1999-2000, and further to 2.3% in 2009-10. And with the sector contracting in absolute terms in the last couple of years, the contribution of the mining sector to India's GDP has come down to 2% in 2012-13.The mining sector has been reeling for more than two years now, under a lethal mix of high borrowing costs on one hand and policy paralysis on the part of the government on the other hand. Mining projects across the country remain stalled owing to environmental, regulatory and land acquisition issues. The study seeks to identify the critical issues and recommend the way forward that would help the sector come out of the impasse.

India produces as many as 87 minerals, which includes 4 fuel minerals, 10 metallic minerals, 47 non-metallic minerals, 3 atomic minerals and 23 minor minerals (including building and other materials). Minerals can broadly be divided into fuel and non-fuel minerals. Coal, lignite, petroleum and natural gas are the four fuel minerals. In a way, atomic minerals also can be clubbed under this category. Essentially these minerals are used for the nuclear power programme in India to generate electricity. Uranium and thorium are the two chiefly known naturally occurring atomic minerals considered as sources of power. India with its vast mineral resource potential, has however, leverage this strength only marginally, Exploration has lagged significantly behind the growth in domestic demand for minerals. Subs sequent value addition to minerals has also been limited. Mining can be a significant contributor to the socio-economic development of vast mineral rich area across India. Concerted effort from all stake holders, governments, planners, policy makers, mining industry, technology and service provider and the local communities is required with good governance & responsible leadership mining has to adopt sustainability as a core agenda in true spirit for long term value creation for the economy as well as social well being.

The usage of natural resources will determine the economic, environmental and social impact in any region. Even though the immediate impact may be local, it has the potential to have an impact on the economic parameters throughout the country. The sector employs a large labor force in the organized as well as the unorganized sector. This is a capital-intensive sector and therefore a priority area for foreign direct investments. The government exchequer earns large revenues from this sector due to the volume and the related taxes and royalty payments. The mining sector has historically been important in the economic development of developing country like India. The mining industry is believed to encourage downstream local production, which brings value addition to that particular mineral and, therefore, the economy grows in the value chain with time.

Coal in India becomes Crucial for Industrial Development

Coal has emerged as the "black diamond" for industrial activities in India due to precarious situation of its availability. Almost all industrial activities where energy remains a key component to determine product price and thereby growth, have affected badly due to non availability of coal.

Industrial development has been an important part of public policy debate for the last decade. It has evolved into a widely subscribed ideal for how business and society should interact and function. Industrial development with sustainable manner have multiple objectives ("three pillars") of sustainable development –economic prosperity, social well-being and environmental sustainability, make it a concept easy to embrace but challenging to implement in a practical manner. While practical implementation is difficult, it is important to accomplish, given the broad societal and governmental pressure for industry to be responsive. Present Outlook of our Indian Coal Industry as fellows:-

- Indian coal reserves vastly overstated, only 70%-72% extractible.
- Coal demand/supply, import gap to rise to 154MT/31.4% CAGR over FY12-17E.
- Low mechanization, OMS offer ample scope to improve productivity.
- Clearances, R&R and land acquisition issues hindering coal production growth.
- Railways to dominate; road share to increase by 12th Plan-end (FY12-17).
- Port capacity sufficient; but rail connectivity the primary hurdle for coal imports.
- Indonesia/Australia to remain favored destinations for steam/coking coal imports.
- Urgent need to open up coal sector, regulator must for proper functioning.
- Exploration of lignite resources can help bridging energy security gap.

From a sustainable development perspective it is instructive to reflect on coal's role at the start of industrial society and subsequently. Apart from their inherent practical limitations at that time, supplies of biomass, wind and water were limited. Coal was abundant and available and new technology allowed it to be used for steam raising and iron making. The environmental consequences of rapidly growing and uncontrolled coal use were, of course, unacceptable. However, continual technology development over time allowed coal to be used with much greater efficiency and with greatly reduced environmental impact.

In addition to its direct role as an energy resource, coal plays a significant global role in sustainable development. Coal mining is a critical contributor to many economies. From providing employment, export and royalty revenues through to local services and the development of infrastructure, coal mining makes a substantial contribution to improving the livelihoods of many. This is especially true in developing countries where coal mining makes a major contribution to national economies allowing them to grow stronger and address the challenges of

poverty and development. Coal is also a key component of important industrial processes such as steel and cement manufacturing – both of which are central to building the essential infrastructure of growing economies.

Economic benefits of coal mining

Coal directly provides more than seven million jobs worldwide and supports many more millions. Coal production is the key economic activity in many communities. In 2011-12 the coal industry invested more than US$7 billion in capital expenditures in developing countries.

The presence of coal mining supports economies in many ways. At the most basic level coal mining provides employment for local communities. These employers often invest in improving the skills of their workforce – skills that can be transferred to other employers and other industries. Employment provided by coal mining does not only benefit the men and women employed at the mine and their families. These jobs support the wider community when the employees' income is spent on goods and services.

Coal mining often occurs in rural and remote areas requiring significant infrastructure development - particularly the development of transportation links such as road and rail. Mining often brings increases in other infrastructure services such as electricity. Improved infrastructure due to mining activity can also support broader economic development within the region.

Mining operations also bring revenues to governments. Companies pay taxes at both the local and national levels and can contribute royalties which help governments fund other services, such as health, education, welfare and security. In cases where coal is surplus to domestic energy needs, coal produced is exported to other countries, earning valuable export income and supporting national foreign exchange reserves. These benefits can be critical to often fragile developing economies.

Many companies also look to invest in the communities within which they operate – well beyond the needs of their mining operations. There are many examples of coal mining companies making sizeable investments in health and education services in their local communities.

Social responsible of coal mining

Coal is found in 70 countries and actively mined in around 50 countries by companies of varying sizes. Many companies are very small operations, in some cases even family-owned. Other companies operate in many countries and some also operate in other commodity sectors.

All companies have an obligation to act responsibly when mining for natural resources. Companies must consider their impact on the environment, the health and safety of their workforces and the communities within which they operate. Different locations have other issues that need to be addressed in different ways.

Many companies also learn from the experience of others and there are many positive stories to tell about the contribution that coal mining makes across the globe.

World Coal Association members place a high priority on responsible mining and commit, as part of their membership, to encourage improvements in mine health and safety and practice corporate social responsibility.

Environmental committed of coal mining

The coal industry accepts that it must substantially improve the environmental performance of its products. This is necessary if coal is to have any claim to sustainability and realize its full potential contribution to economic and social development. The developing country coal industry acknowledges that there have been, and continue to be, real problems in this regard. However, it can respond to and meet these challenges by working to ensure that coal is produced and used efficiently, and that the opportunities for technological advancement – on which a major improvement in coal's environmental performance hinges – are fully and vigorously pursued. The coal industry environmental impacts two ways- firstly during winning of coal as well as transportation and secondly utilization of coal in industrial use. For overcome this environment impacts coal mining industry may perform two part of journey.

- Environmental mitigation during coal mining with restoring the natural balance, e.g. Land use plan, implementation of coal freight transportation norms & ecosystem establishment.
- Efficient environmental performance during use of coal, e.g. High efficiency power generation to reduce CO2 emissions, Carbon capture and storage technology, Utilizing captured CO2 to secure energy supplies, clean fuels from coal, coal to liquids, underground coal gasification.

During the 21st century technological advances allowed a range of new energy sources to be developed – oil, gas and nuclear energy. These partially displaced coal in existing markets and powered new markets, such as

transportation. So far coal consumption continued to grow rapidly in the two applications where it was most suited: centralized electricity generation and iron making. This illustrates that the principles of sustainable development were practiced early last century - even if by today's standards the process was imperfect and there were some grave excesses. Finite resources fuelled economic and social development and continual innovation provided new technologies and energy sources in a continual and fluid interplay between social, economic and environmental priorities. Over time, governments set minimum social and environmental standards and established a framework for markets to function and innovation to flourish.

The importance of coal's advantages – it is abundant, safe to store, available and affordable – has not diminished with time. These attributes along with its wide resource distribution are essential for ensuring reliable electricity supply. Coal has a crucial role in meeting current needs and is a resource bridge to meet future goals through the enhancement of knowledge and technology.

The World Coal Association urges the international community to recognize the essential role energy plays in supporting economic and social development. The international community is also urged to recognize that all sources of energy, including coal, will play a role in achieving energy access targets. Policy frameworks and financial support must be put in place to support the development of advanced coal technologies and Carbon capture and storage (CCS) alongside other clean energy solutions if the world is to meet development and environmental challenges.

Coal: Delivering Economic Growth

Coal is a crucial and enduring element in a modern, balanced energy portfolio, providing a bridge to the future as an important low cost and secure energy solution to sustainability challenges.

Crucial coal:

- Energy demand has grown strongly and will continue to increase, particularly in developing countries where energy is needed for economic growth and poverty alleviation.
- All energy sources will be needed to satisfy that demand by providing a diverse and balanced supply mix.
- As the most important fuel for electricity generation and a vital input steel production, coal will have a major role to play meeting future energy needs..

Affordable Coal:

- In most circumstances coal is cheaper per energy unit than other fuels. As a result, it has remained the fuel of choice for electricity generation on a global basis and is likely to remain so for several decades.
- Coal prices are consistently more stable than oil and gas prices, reflecting coals widespread availability and diverse and competitive markets.

Secure Coal:

- Coal has a unique role to play in meeting the demand for a secure supply. It is abundantly available, affordable, reliable, geographically well- distributed, and easy and safe to transport.
- Coal liquefaction allows coal to act as a substitute for crude oil; synthetic gas can also be produced from coal.

Innovative Coal:

- Environmental effects of electricity production area concern for us all. The challenges for coal-as for all fossil fuels- is to reduce its green house gas and other emissions, while continuing to global development and energy security.
- Coal is on a technology pathway that has already delivered major environmental improvements. Further technical solutions included improved combustion efficiency and reduced emissions, coal gasification, carbon capture and storage, and the production of hydrogen from coal, which will play a part in the transition to a hydrogen-based energy future. The ultimate goal is near complete elimination of emissions.
- Constructive partnerships between energy producers, energy consumers and governments are essential to ensure demand for energy is met. While managing sustainable development and energy security.

There are several grounds for optimism that indicate developing countries can succeed as sustainable energy leaders, even as they make substantial strides toward closing the gap between energy 'haves' and 'have-nots'.

The first is that providing basic energy services to the billions of people who currently lack such services requires at most a modest shift of global resources. At the same time, the price competitiveness and reliability of renewable energy technologies—many of which are particularly well suited to small-scale, stand-alone application—have continued to improve, especially in remote rural areas those are not well-connected to electricity grids or transportation networks. None of this means the tasks facing developing countries will be easy. On the contrary, markets left to their own devices are not likely to choose the cleanest and most efficient technologies most of the time (especially when environmental and other externalities are not reflected in market prices); nor will it always be possible to avoid difficult trade-offs. This is true of markets everywhere in the world. But the trade-offs can be especially difficult in a developing country context where immediate financial and institutional constraints are likely to be more acute than in most developed countries.

All will eventually require the active engagement of coal sectors of society, including individual consumers and local communities, non-governmental organizations, private businesses and industry, the science and technology communities, governments, intergovernmental institutions and donor organizations. Developing countries themselves must take the lead in charting a new energy course. But developed countries must stand ready to provide support, recognizing that they have a vital stake in the outcome. Coal will continue preferential energy need for developing country because:-

- Abundant (Plentiful)
- Affordable
- Every country has indigenous technology resource
- Global competitive coal recovery technology availability
- Key developing countries are coal rich; they wish intent of using it.

Ensuring secure, affordable and sustainable energy requires a diverse energy mix and coal is a key part of that mix. It is both an essential energy resource for electricity generation and a vital raw material for industrial production e.g. Steel, Chemicals and Cement. Coal is vital for long-term sustainable development and can be used in a manner consistent with green house gas (GHG) reduction goals.

Strategic Management Plan for Mass Exploitation of Coal Deposits

It is high time and also there is an urgent need to introduce mass exploitation technology. Mass exploitation of coal deposits refers as “economically excavation of coal with due method of higher productivity, safety and conservation”.

Enhancing coal production by taking up new projects/ expanding existing projects as well as through the captive mining route

- Faster Land Acquisition and statutory clearances.
- Enabling & sustaining high growth in coal sector.
- Enhancing Power Generation / Coal & Lignite Production by taking up new projects.

Supply of adequate quantity of quality coal to meet the demand of all sectors at reasonable price

- Effective compliance of Fuel Supply Agreement (FSA) regime.
- Meeting normative requirement through indigenous production and if required, through import.
- Improvement in coal quality through improved mining processes & coal preparation mechanism.
- Appropriate measures for reduction in ash content to improve quality and reduce transportation cost.
- Institutional mechanism for consumer satisfaction and quality assurances.
- Prevention of coal pilferage.
- Creation of Sarvottam (Best) Compliant System.

To adopt state-of-the-art technology and clean coal technology in coal mining with a view to improving productivity, safety, quality and the ecology

- Encouraging development of large mines with higher capacity equipment & adopting international best practices

- Time bound roll out of IT enabled MIS system for CIL
- Promoting & supporting training/skill up gradation to bridge skill gap
- Advance technology and practices for minimizing accidents in coal mines
- Control of fire and subsidence in Jharia and Raniganj
- Promoting capture and commercial exploitation of Coal Mine Methane/Vent Air Methane
- Development of Underground Coal Gasification
- Promoting clean coal technology in coal mining
- Preservation of ecology
- Promote applied research in coal sector for improving production, productivity, quality and safety.
- Exploring the possibilities of alternate mining technology to exploit deep seated lignite resources such as Coal Bed Methane, Under Ground Coal Gasification etc.,

To expedite bringing all the available resources in the country into the proved category through detailed drilling

- Fast tracking & modernizing coal resource assessment for sustaining higher growth in coal production

To mechanize, modernize and develop necessary infrastructure of rail network, ports and roads for efficient and speedy evacuation of all the coal produced.

- Promoting integrated development of coal mines and evacuation infrastructure
- To promote and encourage development of feeder railway line/ MGR/ Conveyer Belt for linking coal projects with the proposed Dedicated Freight
- Speedy execution of Railway Projects already in pipeline for evacuation of Coal

Acquire and develop coal assets abroad for the energy security needs of the country

- To facilitate and co-ordinate acquisition of coal assets abroad by govt. coal companies
- Preparation of a detailed roadmap for acquisition of coal assets/resources abroad.
- Leveraging bilateral and multilateral relations for coal assets acquisition.

In order to optimize the design of coal mining and reclamation operations, conventional mining engineering considerations and environmental and sustainability goals must be accounted for simultaneously. It is essential to identify all of the parameters, relationships, constraints and desired outcomes related to the widely varying factors that contribute to mine design, as well as the additional factors that should be considered as a part of a new sustainable design approach.

CONCLUSIONS

The use of coal has multiple objectives in the rapidly expanding economies of India. In each country, recent years have witnessed significant economic growth and growing industrial development. In India, coal continues to play an important role in supplying energy to the power generation sector and a number of major industries. Over the past two decades, both coal production and consumption have increased dramatically.

In country like India, a number of major industrial sectors depend on coal as a source of energy. These are examined and current operating practices compared with those adopted elsewhere. Sectors addressed include iron and steel production. Here, China is the world's biggest player, producing more than a third of global output. India is forecast to become the second largest producer by 2016. There are marked differences between the types of technologies deployed in each country.

In India, coal use within the sector is expected to remain significant for many years. The cement industry is also a major coal user. Nearly half of the world's cement is manufactured in China. In both China and India, recent years have seen enormous expansion (much of it coal-based) and the latter is now the second largest global producer.

The industry in South Africa, although smaller, has also seen major growth. In each, coal remains the main choice of fuel. Coal is also important for brick making in all three. Clay bricks are used in huge numbers throughout the world, many produced in coal-fired kilns. The world's two biggest brick producers are China and India. Coal use in the new economies of India because:

- 'Coal production and consumption has increased dramatically'
- 'Coal continues to play an important role in supplying energy to the power generation sector'

- ‘Coal will continue to provide a significant proportion of each nation’s energy needs’

A progressive industry committed to technological innovation and improved environmental outcomes within the context of an economic balanced and responsible energy mix for developing country like India.

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