SUSTAINABLE DEVELOPMENT FOR INDIAN MINING SECTOR

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Abstract: Corporations in India are under growing pressure from internal and external stakeholders to achieve corporate sustainability and consider the economic, environmental and social implications of their activities. Sustainability reporting is gaining momentum globally as an important communication tool for companies to disclose their sustainability plans and performance and enhance stakeholder confidence. From the beginning of human civilization, mining is anticipated as a "dirty" and polluting industry, amenable to corruption and illegal operations. Mining is an activity which requires a special consideration, especially from environmental activists and civil society groups. The Mining sector is essential for economic development but mineral extraction tends to have considerable negative effects on environmental and societal. Historically, the extraction of mineral reserves has always resulted in varying degrees of environmental resource degradation and social impacts all across the globe. It has been facing severe criticism on several issues relating to its performance vis-à-vis sustainable development. The present study is an attempt to examine various issues and initiatives on sustainable development in the context of the Indian mining sector. The author finding suggests that the Indian mining sector is having various issues related to social and environmental aspects as well as gender issues, to solve these issues Indian mining sector must adopt the principles of sustainable development that seek to balance economic, social and environmental and for the bright future of the mining sector . Undoubtedly India has an elaborate legal framework with a large number of laws relating to environmental protection such as the Water pollution Act (1974), Air pollution Act (1981) etc. In Indian mining sector, there is strong need to create more agencies as a Draft MMDR Bill 2011 proposes to do through the creation of more regulatory bodies and new mechanisms for coordination among them. Moreover this study highlighted that the Indian Bureau of Mines (IBM) under the Ministry of Mines, Government of India has the responsibility of monitoring the proper enforcement of the rules. However this study contends that Indian mining sector have been showing positive signs in embracing the principles of sustainable development that seek to balance economic, social and environmental well being now and for the bright future for mining sector. Recent policy development, government policies, laws and procedures as well as industry behavior and practices to these principles shall also encourage the reporting efforts in Indian mining sector.

Keywords: Environment, Mining sector, Social , Sustainable development.

INTRODUCTION

Nowadays corporate houses have been called upon to fulfill the need of different stakeholders who pay attention to company's value. Apart from financial reporting, companies need to communicate the non-financial information as well to the shareholders. Financial growth is no longer an exclusive driver of business. Social and environmental facets play a very significant role. Corporate sustainability is the conjunction of two terms –sustainable development and corporate social responsibility. Corporate social responsibility is also known as CSR reporting and triple bottom line (TBL) reporting. Ballou et al (2006) incited in his study that these reports are focus on the non-financial performances of the organization and are increasingly being published by companies in various part of the world. Financial performances of corporate houses are no longer sole driver of business. However, the existence of sustainability reporting (SR) is recent in contradict to financial reporting.

The purpose of this paper is to study the various initiatives and trends of sustainability reporting in Indian mining sector. In present scenario, Mining companies are facing challenges to contribute to the sustainable growth of the communities in which they operate by having behind less negative impact on the society. Mining as an activity has been there since the beginning of human society and minerals have contributed to the development of human civilization since the Stone Age. For most of its history, however,

mining was dominated by mining benefits staying in the hands of too few people with little regard for environment, local community or development. Generally speaking, society, often mainly comprising indigenous, relatively backward communities in mining areas, has been silently tolerating the damaging impacts of mining.

Many countries especially developing countries are facing increased growth in the mining industry. Most developing countries have already environmental standards for emission effluent; ground water contamination is place as well as hazardous and toxic management guidelines.

Based on the above background, this paper focuses on the Indian mining sector. The aim of present paper is to scan the various initiatives, issue and trends of sustainability reporting with special reference to Indian mining sector. The paper is structured in to six sections. It begins with a brief introduction followed by a brief overview on sustainable development. The third section provides a discussion on sustainable development, its evolution and various initiatives in context to the mining sector. Section four presents a brief review of the Indian mining sector. Fifth section gives a brief overview about the framework of Indian mining industry for sustainable development, various issue and initiatives of sustainable development in respond to the Indian mining sector and final section concludes the paper.

SUSTAINABLE DEVELOPMENT

Reporting on non-financial information is begun in the late 1980, in US. At that time environmental reporting was the main focus, as the external stakeholders became anxious with the impacts of organization on a wide variety of community resources (eg air, land and water emissions, waste and whether the resources would be sufficient for future growth). Sustainable development is a broad concept that stabilizes the demand for economic growth with environmental protection and social equity. Deegan (2000), contend in his study put that globally we must ensure that our generation's consumption patterns do not negatively impact on future generation's quality of life. Hubbard (2008) reported in his study that in 1998, Elkington developed the term "triple bottom line" to argue the case for reporting environmental and social performance together with economic performances.

The triple bottom line concept implicit that the economic, social and environmental should be balanced and give equal importance. This triple bottom line also knows three Ps: planet, people and profit. Every corporate house is concentrated only one line of triple bottom line i.e. profit. To be sustainable organization, corporate should give attention to each line of triple bottom line i.e. planet (environment), people (social) and profit (economic). Lopez et al (2007) reported that companies are becoming aware that they can contribute to sustainable development by reorienting their operation and process.

Notwithstanding, there are some threat of sustainable development such as population, shortage of drinking water, human health , consumption of energy and deforestation. These threats are convoluted and serious and it can't be transmit in the same way as it was created. But without doubt it can be addressed. In order to encounter these challenges, various indicative actions have been undertaken by global bodies worldwide Sustainable development is a vision and a way of thinking and acting so that we can secure the resources and environment for our future generation.

The term was first popularized in 1987, in *Our Common Future*, a book published by the World Commission on Environment and Development (WCED). The World Commission on Environment and Development headed by Gro Brundtland, defines sustainable development as meeting "the needs of the present without compromising the ability of future generations to meet their own needs"(Brundtland ,1987) . Apart from the definition, it covers other two important key aspects: (a) the thought of *needs*, in particular the essential needs of the world's poor, to which overriding priority should be given; and (b) the concept of *limitations* imposed by the state of technology and social organization on the environment's capability to meet present and future needs.

The Brundtland Commission also saw sustainable development as a process of change rather than a fixed state of harmony. The Brundtland definition of 'sustainable development' has some implicit and explicit values; based on these values, a set of guiding principles have evolved over the years in order to meet the needs now and in the future for human, economic and social development within the life support systems of the planet. Although the concept of "needs" or its implications have not been explained in the definition, most discussions "have retained the core ethic of intergenerational equity, emphasizing the current generation's moral obligation, to ensure that future generations enjoy at least as good a quality of life as the current generation has now" (World Development Report, 2003). Thus, many threads of thought have been interlinked into the concept of 'sustainable development'. Though somewhat ambiguous, the concept has relevance and meaning as well as a broad appeal at national and international levels. In translating the concept into specific operational

terms, it will be necessary to adapt its principles and values to specific economic, social and environmental circumstances.

MINING RESPOND TO SUSTAINABLE DEVELOPMENT

The 1970s and 1980s were a time of reaction to dramatic change for mining. Echoing increasing concern for the environment across society, the late 1980s saw a number of leading mining companies publish "state-of-environment" reports related to their operations. Taking another important step, 30 leading mining and metals companies from across the world came together in 1991 to create the International Council on Metals and the Environment (ICME). For the mining industry, the decade of the 1990s was a bleak period. Commodity prices dropped while public criticism skyrocketed, much driven by a civil society that was quick to take advantage of newly available and quickly evolving computer-based communications. As a whole, the industry found itself under attack and in a defensive posture. Its *social license* to operate was threatened (though that particular label was to come later). In the late 1990s and faced with growing concern about access to capital, land, and human resources, the chief executive officers of nine of the world's largest mining companies took an unprecedented step. The mining sector is integral for the development and economic growth of developing country like India. Mining companies are among those that pioneered the production of environmental reports. Sustainability issues have assumed considerable importance in major mining nations as the account in respect of Canada, Australia, South Africa and Papua New Guinea (PNG) shows. These countries take a comprehensive view of sustainable development in mining that includes apart from environment, other important dimensions such as local stakeholder engagement, socio-economic development in mining project areas and transparency in communication with stakeholders. The mechanisms of Social and Labour Plan in South Africa, Mineral Development Fund in Papua New Guinea and Impact Benefit Agreement in Canada are examples of legally-binding instruments that make it obligatory for mining companies to take up local development works in their respective mining project areas (planning commission, 2012). Noranda, a Canadian mining and metals company, released its first report in 1991 (Noranda 1991) and then reported annually. By 2002, eight out of the ten biggest mining companies were publishing annual environmental reports as a stand-alone document, i.e., separated from general annual reports (Jenkins and Yakovleva 2006). Sustainability reporting is potentially a meaningful tool for mining companies to communicate their policies and achievements. Evolving from purely environmental performance to comprehensive sustainability reports is one adaptation by those companies to a ''new operating paradigm that has shifted from a 'do no harm' approach to a 'demonstrate positive development benefit' imperative'' (Warhurst, 2001).

Mining operations frequently involve a high degree of environmental impacts, which can extend well beyond the extent of mineralized areas. The impacts of a mining operation commence with exploration activities, extend through extraction and processing of minerals, and may continue well beyond post-closure of the operation. The nature and extent of impacts vary during the various stages of the project life. For operations in these "overseas" regions reporting on environmental performance is less likely to make a significant difference to how "welcome" a mining operation is. Mining is the world's second oldest and most important industry after agriculture (Down and Stocks, 1977). Mining is currently the fifth largest industry in the world and it plays a crucial role in world economic development, and the trade of mineral commodities represents a substantial part of international trade (Madeley, 1999; Pastizzi-Ferencic, 1992). Various impact of mining sector on environmental and social are prescribe in Table 1.

H. Jenkins & et.al. (2003) cited in his studied that Mining industries perform various activities such as extraction of minerals, processing of minerals and transportation of these minerals to market place. Years of unregulated mining and mineral processing activities like drilling, blasting, crushing and other associated activities have not come without high environmental costs. In comparison with other sectors, the potential social and environmental issues associated with mining and mineral processing operations are both significant and complex to manage. The discovery, extraction and processing of mineral resources is widely regarded as one of the most environmentally and socially disruptive activities undertaken by business. Moreover, many international agencies have developed environmental guidelines for mining operations and major mining companies have adopted codes of conduct and are operating community development programmes that go beyond conformity to laws and regulations. Mining sector is only sector which consumed large environmental services for production input (air, water and soil). Because of extraction of mineral reserve, environmental resources are degrading and putting negative impact on society, including displacement, all across the globe. In the last few years, climate change has become a big issue for businesses across the world, including the mining industry.

Table 1: Key Impact of Mining Activities on Environmental and Social Activities

Key environmental impact of mining activities	
Impact	**Description**
Waste generation	Tailings are the materials left over after the process of separating the valuable fraction from the uneconomic fraction of ores. One method of disposing of tailings is dumping into rivers, seas or lakes, a practice that poses risk to the environment. While mining projects in countries need to conform to stringent environmental standards, tailings are of considerable and growing concern among NGOs and regulators.
Natural resources	The management of the environmental impacts of mining operations and access to natural resources are strongly linked. Mining processes require constant supplies of water and some mines, particularly those involving lower grade deposits, can be quite **water intensive**, which can have a huge impact on the immediate and local area. As a result, water availability and in some regions, water shortages amplified by climate change, are of concern to companies and investors alike. Mining also disrupts habitats and leads to loss of biodiversity.
GHG emission	GHG emissions from the mining process are mostly associated with the consumption of energy and the use of diesel fuel in remote locations. Downstream, smelting and refining processes do require significant amounts of energy that, if derived from **fossil fuels**, can contribute significantly to climate change.
Key social impact of mining activities	
Occupational health and safety	Occupational health and safety (OHS) is among the major employee related challenges facing the sector. The most common **employment related diseases** in the sector are pneumoconiosis, silicosis, and asbestosis and lung cancer. Because of these negative perceptions of poor health, as well as low job prospects and poor quality of life, the industry faces a challenge in attracting highly competent employees.
Human right	Unfairly low wages, child labour, the exploitation of women, the violation of indigenous rights are among the issues associated with the industry. Protection of **human rights is a social concern** that needs to be addressed on priority in the Industry
Resettlement and Rehabilitation	Resettlement necessitated due to mining activities can lead to landlessness, increased unemployment, lack of access to basic necessities such as housing, unavailability of common resources for displaced people. Thus, compensation, resettlement and land claims of indigenous people issues should be handled with care.

Table 2: Major International Initiatives in mining sector driving sustainable development

Initiatives / organization	Focus / objectives	Description
International Council on Mining and Metals	Strengthen the contribution of mining, minerals and metals to sustainable development.	It seeks to play a leading role within industry in promoting good practice and improved performance and has a vision for a respected mining and metals industry that is widely recognized as essential for society and as a key contributor to sustainable development. It has 19 member companies and 31 member associations covering over 800 mine sites in 54 countries. The ICMM developed a Climate Change Policy in 2009 which calls for "comprehensive and sustained global action... to reduce the scale of human-induced climate change and to adapt to its impact." It commits itself and its members to "play our part in making possible the concerted global effort that is needed to address the climate change issue."
Cancun Communiqué	Energy efficiency across all sectors, low carbon energy systems, emission capture and storage, emissions from other greenhouse gases and urban planning, land use management and land use change.	Initiative started by The Prince of Wales's Corporate Leaders' Group on Climate Change which is run by The University of Cambridge Programmed for Sustainability Leadership. The major mining companies signed up to the communiqués, reiterating their commitment to addressing the challenge of climate change.. It called for an ambitious, robust and equitable global deal on climate change that responds credibly to the scale and urgency of the crises facing the world today.
Inter governmental forum	improve and promote the contribution of the mining, minerals and metals sector to sustainable development and poverty reduction.	The Intergovernmental Forum on Mining, Minerals, Metals, and Sustainable Development (IGF) are an outcome of the World Summit on Sustainable Development held in Johannesburg in 2002. The IGF is the only global intergovernmental policy forum in the mining/metal sector. It is a voluntary initiative officially established in 2005 by national governments interested in promoting good governance in the management of mineral resources, a driver of development. It has 43 member countries – including Burundi, Kenya, Uganda and Tanzania. In December 2010 the IGF produced a Mining Policy Framework.
Global reporting initiatives	Focus on economic, social, and environment reporting.	The GRI sustainability reporting framework provides guidance on how organization can disclose their non-financial performance. The first version of the GRI guidelines was issued in 2000 of the guidelines' was unveiled at the world summit on sustainable development in Johannesburg. The third version of the Guidelines, G3, was published in 2006, and is freely available. Other components of the Framework include Sector Supplements and indicators for industry sectors (social, economic and environmental).GRI reporting has become common practice among large mining companies, and it is usually requested by shareholders.
Carbon disclosure project	to address the challenge of climate change by putting information at the heart of decision making.	Over 3,000 organizations in 60 countries measure and disclose their GHG emissions, water use and climate change strategies through CDP. This information is made available to institutional investors, corporations, policymakers and their advisors, public sector organizations, government bodies, academics and the public. CDP uses the information to develop international carbon reporting standards. Companies are scored both for level of disclosure and for their performance and listed in the Carbon Disclosure Leadership Index and Carbon Performance Leadership Index for their sectors, each year. CDP has grown rapidly in the last seven years, from 235 responses in 2003 to 3,050 responses in 2010. The leadership indices could become key factors in investor and business decision making and promote better planning for adaptation and mitigation in response to climate change.
CEO Water Mandate		The CEO Water Mandate was launched in 2007 and is a unique public private initiative designed to assist companies in the development, implementation and disclosure of water sustainability policies and practices. It recognizes that the business sector impacts water resources, through the production of goods and services, both directly and through supply chains. The CEO Water Mandate covers six elements: 1. Direct Operations, 2. Supply Chain and Watershed Management, 3. Collective Action, 4. Public Policy, 5. Community Engagement 6. Transparency

Nowadays, corporate houses criticized for their misbehavior towards environmental and social the mining industry has shown increasing interest in environmental and social sustainability in recent years. Megan Cole Ryan Hogarth (2011) in his working paper mentioned that Climate change poses a number of risks and opportunities to business. Initiatives are emerging as important tools for addressing international domestic environmental, social and ethical issues. The recognition ad use of voluntary initiatives is growing at both levels of broad corporate responsibility, and in specific sectors. In response, international organizations have developed climate change policies and a few influential global initiatives have begun. Throughout the world lots of initiatives are taking place for minimizing negative impact of the mining sector on environment and society. Table 2 outlines some of the major international initiatives that have led to the increased level of sustainable development in the mining sector.

INDIAN MINING SECTOR

India is endowed with vast and abundant reserves of key minerals such as iron ore, bauxite, gypsum, limestone, mica, chromite, manganese, zinc and graphite. The total value of mineral production was Rs. 568070 million in 2000-2001, of which the value of minerals other than petroleum and natural gas was Rs. 306751 million. The metallic production is accounted for by iron-ore, copper-ore, chromite and/or zinc concentrates, gold, manganese ore, bauxite, lead concentrates. Amongst the non-metallic minerals, more than 90 percent of the aggregate value is shared by limestone, magnesite, dolomite, barytes, kaolin, gypsum, apatite & phosphorite, steatite and fluorite. The country produces 87 minerals, including 4 fuel minerals, 10 metallic minerals, 47 non-metallic minerals, 3 atomic minerals and 23 minor minerals. Moreover, India is the world's largest producer of mica blocks and mica splittings. With the recent spurt in world, demand for chromite. India has stepped up its production to rech the second rank among the chromite producers of the world. Besides, India ranks, 3rd in production of coal & lignite, 2nd in barites/ Bareyte, 4th in iron ore, 5th in manganese ore and 6th in bauxite. Below table 3 prescribed the India contribution towards mining production.

IBM (1999) reported that in the 1996-97 production statistics, India stood as world's largest producer of mica blocks and mica splitting and ranked second in the production of chromites, third in coal & lignite, and barytes, fifth in iron ore, sixth in bauxite and manganese ore, eleventh in aluminium and twelfth in crude steel in the World . The country is a leading producer of assertive key minerals such as iron ore and bauxite. The country's mining industry is thus, a important segment of the national economy. Presently, mining contributes 2.3 % (advanced estimates at 2004-05 prices), to the country's GDP. This mining industry is largest employers in India, employing one million workers which is around four percent of the Indian workforce. PDAC, (2013) report showed that around 2,103 billion (US $ 41.4 billion) mineral production made in the year 2011-12. Rough Diamond, Tungsten, Gold, Copper concentrate, Potash, Nickel/Tin, Thermal Coal, Zinc concentrate and coaking coal are some of the major minerals being imported during the year 2011-12. The top 10 mineral production during 2011-12 are shown in table 4.

The mining industry is under increasing pressure in its traditional home regions where ore body depletion and restrictions on land access for exploration are increasingly constraining operations. One solution is for members of the industry to promote a less negative image in these traditional home regions and this is where environmental reporting plays an important role. Although reporting may lessen some of the constraints on mining, depletion and other restrictions have long led mining groups to invest outside their home regions, in countries where environmental concerns receive less attention. In these regions environmental reporting plays a lesser role, thus adding to the attraction of investing there.

INDIAN MINING SECTOR TOWARDS SUSTAINABLE DEVELOPMENT

Both central government and state government of India managed the mineral resources. The mines and minerals (Development and Regulation Act , 1957 (MMRD) and the mines act , 1952, together with the rules and regulations framed and these laws constitute the basic governing law for Indian mining sector. Dr. Sukumar Devotta in his report proposed that the Mineral Conservation and Development Rules, 1988 lays down guidelines for ensuring mining on a scientific basis, while at the same time, conserving the environment. The minor minerals are separately notified and come under the purview of the State Governments. All mining activities have to comply with the environmental legislation of India. The relevant acts are Environment Protection Forest (Conservation) Act 1980 (amended in May 1992) and Environment Protection Act and Rules 1986. The Environmental Impact Assessment Notification, 1994 also apply for all the mining projects. In India, it has been seen that mining sector are most hostile towards women and overshadow by male. P.nayak etal (2005) showed and contends in his study that the mining industry in India has been highly a male-dominated patriarchal industry; it has been the most hostile industry towards women.

Table 3: India's Contribution in Mineral Production 2011-12

Mineral	Unit	Production		Contribution %	India's rank in world
		World	India		
Chromite	000 T	18,700	3413	18.2	2nd
Bareyte	000T	7,100	2138	30.1	2nd
Talc/ Steatite/Pyrophyllite	000T	7,400	1077	14.5	2nd
Coal & Lignite	MT	6938	566	8.2	3rd
Iron Ore	MT	2248	219	9.7	4th
Kyanite, Andalusite & sillimanite	000T	440	36	8.2	4th
Manganese Ore	MT	33.4	2.44	7.3	5th
Bauxite	MT	199	139.52	7.0	6th

Source: - PADC 2013, Investment Opportunities in the Mining Sector India Day

Table 4: Top Ten Mineral Production in the year 2011-12

Mineral	**Production**	**Value in Rs. Billion**
Petroleum (crude)	38.08 mt.	695.42
Coal	539.85 mt.	626.76
Iron Ore	167.289 mt.	379.65
Natural gas	46,576 mcum	174.31
Lignite	42.897 mt.	48.28
Chromite	3.764 mt.	26.52
Zinc Concentrate	1.412mt.	19.89
Manganese Ore	2.349 mt	11.71
Silver	207,142 Kg	11.56
others	-----	86.33

Source: - PADC 2013, Investment Opportunities in the Mining Sector India Day

Table 5: Four Main Act or Statue to regulate the impact of Indian Mining Sector

Name of Acts	origin	description
The water Pollution Act	1974	It provides for the prevention and control of water pollution and the maintenance or restoration of wholesome quality of water. It is an appropriate step for the management of water pollution; the maintenance or restoration of wholesomeness of water; the establishment, with a view to carrying out the purposes aforementioned, of Boards for the prevention and control of water pollution; conferring on and assigning to such Boards powers and functions relating thereto and for matters connected therewith. The Act provides penalty, for the contravention / failure of compliance of any order or direction given under certain provisions of this Act, for which no penalty has been elsewhere provided in this Act, of an imprisonment for a term which may extend to three months or with fine which may extend to ten thousand rupees or both and in the case of a continuing contravention or failure, with an additional fine which may extend to five thousand rupees for every day during which such contravention or failure continues after conviction for the first such contravention or failure..
Air pollution Act	1981	The Act envisages the constitution of a Central Board at the national level and State Boards in each State for control of air pollution, with certain powers and functions assigned to both. By adopting an integrated approach, the Act provides that the Central Board already constituted under the Water Act shall exercise the powers and discharge the functions of the Central Board under the Air Act. Likewise, various existing State Boards under the Water Act will also look after pollution of air. Under Sec. 21 of the Act, no person can, without the previous consent of the State Board, establish or operate any industrial plant in an air pollution control area. After considering the application made to it and making such inquiry as it may deem fit, the State Board must, within a period of four months, by an order in writing, and for reasons to be recorded in the order, grant its consent subject to such conditions and for such period as may be specified, or it may refuse its consent.
The forest (conservation Act	1980	This act requires the approval of the Central Government before a State ‘dereserves’ a reserved forest, uses forest land for new forest (including mining) purposes, assigns forest land to a private person or corporation or clears forest land for the purpose of reforestation. An advisory committee known as the Forest Advisory Committee constituted under the Act – advises the central government on these approvals. Contravention of the Act attracts up to 15 days in jail. The Forest (Conservation) Rules 2003 framed under the Act prescribe, among the things, the composition of the advisory committee and the factors it should take into consideration while formulating its recommendation to the Central Government on various proposals received for ‘forest clearance’.

As compared to other industries, integration and participation of women has been very slow in mining. While women have never been forbidden from working above ground, the number of women employed under and above ground has traditionally been low. Over the years with changes in government policy, discriminatory laws forbidding women to work underground have been repealed, and women are now free to work underground, but very few women are indeed working underground. Most of the jobs of women relate to menial lower rung activities like sweepers, cleaners or attendants in the mining offices. Women mining labourers in the age-group of 15-19 years which forms only 27% of the total women labourers in mining whereas 40% of women labourers belong to the age group of 5-14 years which speaks of a form of exploitation of women . Women are mostly absorbed in small, private or unorganized sector where they are easily retrenched. Beside this gender issues, mining operation regularly involve a high degree of environmental impacts. These impacts start with exploration activities, extend through extraction and processing of minerals and may continue well beyond post-closure of the operation. These impacts vary from stage to stage. In Indian mining sector there is apprehension architecture of policies, laws and regulations in order to ensure environmental sustainability of mining operation in India. There are environmental policies and legislation generic to all industries including mining; there are also laws and regulations specific to the mining industry. The administrative arrangements for their enforcement tend to be complex because of the division of responsibilities between the central and state governments and also between the functional agencies such as the mining, forest, environment and health bureaucracies (at both the state and federal levels) and the pollution control boards (Planning commission , 2011-2012).

But unfortunately these laws and regulatory instruments, are not working properly due to the lack of enforcement towards these policies, laws and regulations. This has concluded in an aggressive non-governmental organization (NGO) or citizens' movement and pro-active judiciary mainly responding to the citizens' complaint against environmental degradation caused by private greed, indifferent governance of environmental regulations and administrative sloth. There are specific provisions for environmental protection in the constitution of India. There is one article 48A introduced by the Constitution (42nd Amendment) Act 1976 provides as a directive principle of state policy that "The State shall endeavor to protect and improve the environment and safeguard the forests and wild life of the country". Article 51A (g) in a new Chapter entitled "Fundamental Duties" imposes the responsibility on every citizen "to protect and improve the natural environment including forests, lakes, rivers and wild life …". Nevertheless, The Directive Principles of State Policy of which Article 48A is a part are in the nature of policy prescription though not legally enforceable in a court of law. However, these are being increasingly referred to by the judges as complementary to the fundamental rights. There are numerous case related with environmental and social concern. Among them, several environmental cases, such as Virendra Gaur vs. State of Haryana 1995(2) SEC571, 588 and M.C. Mehta vs. Union of India AIR 1988 SC 1037, 1038, the Courts have been guided by the language of Article 48A. In the case, Sachidanand Pandey vs. State of West Bengal (AIR 1987 SC 1109, 1114-15), the Supreme Court held that whenever problems relating to ecology are under its consideration, it is "bound to bear in mind" the provisions of Articles 48A and Article 51A(g) of the Constitution.

The Indian Bureau of Mines (IBM) under the Ministry of Mines, Government of India has the responsibility of monitoring the proper enforcement of the rules. There are two ways that the agency discharges the function. First, the Rules themselves put an obligation on the operators of mines to follow the best practices prescribed for scientific mining and submit various prescribed plans, schemes and reports to the authorized officials of IBM and in some cases, the concerned state governments. IBM scrutinizes these reports and in some cases like the mining plans, schemes of mining and mine closure plans, provides the required approvals and then monitors their implementation. Second, IBM officials undertake field inspections/studies for the enforcement of the provisions of MCDR 1988. During inspection, IBM officials ensure that various elements of scientific mining are followed in the mines operations and sometimes they also provide guidance to the mines operators and officials in the areas of scientific mining including protection of the mines environment.

Framework of Indian Mining Sector for Environmental Protection

In many countries, for economic and social development, Mining as one of activity plays a crucial role. Undoubtedly India has an elaborate legal framework with a large number of laws relating to environmental protection. To regulate impact of mining activity in the country, there are following four main statutes which are prescribe in the table 5.

Apart from environmental impacts, mining operation is also having drastic impact on the health of the peoples who living in mining region. Majority of health problems are caused due to less pollution check and high levels of toxicity, mine tailing and

mine disaster. These health issues are varying from one mineral to another mineral, types of mining and size of operations. Due to the immutable release of the chemical wastes, dust generated by blasting, drilling and excavation and the dumping of mine wastes the lands, water bodies, air and environment are polluted day by day. These chemical wastes of mining industry give birth too many respiratory illnesses due to inhalation of dust particles and become victims of many skin diseases, experience malfunctioning, which has long term impact on peoples health's of mining region .most of common diseases which are just because of dust particles of mining operation such as tuberculosis (coal mines), cough and cold, malaria, skin diseases, diarrhea, staining of teeth joints pain, lethargy etc. Additionally, effects of mining operations have much negative impact as compared to positive impact. For example, one of the most serious impact of these activities is on the peoples who are living in Jaduguda (Jharkhand). It was observe from the last past decades, the indigenous Santhals of Jaduguda, in Jharkhand's Singhbhum District, have lived in the massive shadow of the Uranium Corporation of India Limited (UCIL). India's ambitious and much-discussed nuclear programme is based on uranium mined in this area. In the villages of Jaduguda, most families have at least one member working in either the UCIL mill or the mines. As a result, people in Jaduguda enjoy a degree of prosperity unusual in this impoverished Indian state .Ill health is widespread, and accidents can occur anytime. Indeed, on 24 December 2006, in Dungridih village near Jaduguda, a pipe burst, discharging radioactive waste into a nearby rivulet. The pipe was being used to move the waste from a UCIL plant to a storage dam. No alarms went off at the plant, nor did anyone from the mill bother to warn the village people about the leak – although some Dungridih villagers did quickly alert UCIL officials. Lethal sludge continued to leach into the water for nine hours, killing fish and affecting nearby and downstream communities that depend on the watershed for both fishing and irrigation. Anil Kakodkar, the head of the Indian Department of Atomic Energy, when he visited Jaduguda in early February, noted only that there had been a "small" leak in the pipeline, and hastened to note that it was of no risk to anyone. It is still not clear why the pipe burst. Here, despite the depressing situation of miscarriages, giving births to physically and mentally deformed children, deaths and terminal illnesses like leukemia and thalasemia, and despite international lobbying and publicity on this issue our government chooses to disrespect and continue the abuse of women's health. Nor did UCIL make any effort, then or later, to provide an alternative supply of water to the affected community. But apart from these disastrous, Jaduguda uranium mines is doing positive for community development and environmental protection. This mine is putting special emphasis to ensure safety in the mines and processing plant in order to avoid accidents. Moreover, India has taken a lead in setting environmental standards for products and processes besides introducing environmental impact and life cycle assessments, eco labeling and environmental audits. The Ecomark Scheme, Green rating and ISO: 14001 certification are some of the visible outcomes of the efforts. The environmental impact assessment programme is intended to eliminate problems in the integration of trade and environmental issues. On the other hand government provides subsidies, tax incentives and 100% depreciation allowance for the establishment of non-conventional energy generating units. In the area of relevance to the industry, Government has been adopting both preventive and primitives methods. Fiscal incentives are provided for the installation of pollution abatement equipment in the form of customs duty exemption and soft loans. Environmental behaviour of mining enterprises has shown considerable variation depending on their sizes and technological and technical capacities. There are still others, mostly those using semi-mechanized or manual mining methods (mostly small mines) which tend to conform to the prescribed norms more in form than in substance.

CONCLUSION

Mining industry is considered as male dominated industry and unfriendly for women's work participation in this industry. Because of lack of technology, most women mine workers are found in small scale mines and informal/unorganized sector mines where mining companies easily avoid scanning, have very poor checks on them in all spheres - whether implementation of labour rules and regulations, mine safety rules, environment protection or waste management all of which have direct impact on women and child labourers working in the mines. Mining has brought about gender issue therefore the first issue which is discussed in this studied is gender issue. This is all because the negative attitude to women in mining sectors. Second issue is negative impact on environment by mining operations and their wastage. A major reason is the ineffective implementation of the existing mining and environmental laws and regulations providing for corrective and mitigation measures (such as compensatory afforestation, land reclamation and prevention of illegal mining). Moreover there is large variation in the environmental behavior of mining enterprises. Large mining companies concerned for scientific mining, environmental protection and limited social-development, while small scale enterprise is focused on maximum extraction of mineral resources from their lease areas. Developed

countries are taken in to consideration all regulatory mining and environmental laws that are strictly enforced on the mining sector as compared to developing countries. However in many mining operation countries consultation with local communities during different phases of the mine life cycle is legally mandated. By law, mining companies are obliged to produce an environmental impact assessment at the project proposal stage. No mechanism exists, however, to verify the independence of these reports nor to investigate their accuracy. In Indian mining sector, there is strong need to create more agencies as a Draft MMDR Bill 2011 proposes to do through the creation of more regulatory bodies and new mechanisms for coordination among them. Aligning government policies, laws and procedures as well as industry behavior and practices to these principles poses a major challenge in the country's mineral sector. India has reasonably good legal framework to address issues related to mining sector but these laws aren't being enforced to such an extent that they are almost meaningless. Instead the efforts should be to bring about administrative reforms which will end the present duality and make state government agencies fully responsible and accountable for mineral administrative in their respective jurisdiction. The field-level arrangements should receive special attention. IBM, under the reformed arrangement, should function as a technical consultancy and advisory body assisting the state governments and the mining industry in their technical tasks. Indian governance system whenever a problem is faced-and ensuring sustainable mineral development does pose a problem – the tendency is to create more bureaucratic structures with additional powers in order to fix the problem. In reality these complicate the issues and create additional problems. So, for solving this issues for mining industry in India, and for its healthy development, must adopt the principles of sustainable development that seek to balance economic, social and environmental well being now and for the bright future of Indian mining sector.

REFERENCES

[1] Adams M, Thornton B, Sepehri M (2010), "The impact of the pursuit of sustainability on the financial", sustainability and green Business, retrieved from http://www.aabri.com/manuscripts/10706.pdf accessed on 10-05-2013.

[2] Air pollution act (1981) retrieved from http://infotoolsindia.com/globalenvirosolutions/GetCriteria.php?Link=GES&FileName=SalientFeaturesAiract accessed on 10-05-2013.

[3] Annisa Hayatun N. Burhan, Wiwin Rahmanti (2009) , "The Impact of Sustainability Reporting on Company Performance," journal of economics, Business and AccountancyVentura , Vol. 15, No.2, pp: 257-272.

[4] Ballou, B., D. L. Heitger, C. E. Landes, and M. Adams.(2006), " The Future of Corporate Sustainability Reporting," Journal of Accountancy, Vol. 202, No.6, pp:65-72.

[5] Dr. Devotta S, Towards Sustainable Mining Industries in India – Challenges, retrieved from http://www.teriin.org/events/docs/sukumar.pdf, accessed on 5-05-2013.

[6] Deegan, Craig (2000), " financial accounting theory" , Beijing: mc graw hill.

[7] Down, C.G. and Stocks, J (1977), "environmental impacts of mining" , Applied Science Publishers ltd, .

[8] Environmental protection act (1986), retrieved from http://www.vanashakti.in/environment_protection.html , accessed on 10-05-2013.

[9] Hilson, G., 2000a. Barriers to implementing cleaner technologies and cleaner production (CP) practices in the mining industry: a case study of the Americas. Mineral Engineering Vol.13, No.7, pp. 699–717.

[10] Hubbord, graham, (2008), December 15" beyond accounting-assessing the impact of sustainability reporting on tomarrow's business", retrieved from http://www.icaew.com/~/media/Files/Technical/Sustainability/graham-hubbard-sustainability-reporting-discussion.pdf A discussion paper, Adelaide, Australia, accessed on 10-05-2013.

[11] H. Jenkins, and N. Yakovleva (2006), " Corporate social responsibility in the mining industry: Exploring trends in social and environmental disclosure", Journal of Cleaner Production, Vol. 14, No. 3-4 , pp: 271-284

[12] Lele, S. M. (1991) 'Sustainable development: a critical review', World Development, Vol 19, No 6, pp 607–621.

[13] Lopez, M Victoria, Arminda Garcia, and Lazaro Rodriguez, (2007), "Sustainable Development and Corporate Performance: A Study Based on the Dow Jones Sustainability Index", *Journal of Business Ethics*, *Vol.* 7, pp: 285-300.

[14] Labour and Women in Mining,retrieved from ww.minesandcommunities.org/mineral/women4.htm accessed on 3-05-2013

[15] Mineral contribution (2012), retrieved from https://sites.google.com/site/hindustancopperlimitedsite/india-s-contribution-to-the-world-s-mineral-production, accessed on 10-05-2013.

[16] Michael John Jones (2010),"Accounting for the environment: Towards a theoretical perspective for environmental accounting and reporting," Accounting forum, Vol. 34, pp:- 123-128.

[17] Mitra, Kumar Pradip (2012), 'Sustainability Reporting Pratices in India: Its Problems and

Prospects', International Finacial Services & Management research, Vol.1 No.5, pp 109-115.

[18] Madeley, j (1999), "big business, poor people: the impact of transnational corporation on the world's poor," Zed books, London.

[19] Pastizzi-Ferencic, D (1992), "natural resources and environmentally sound sustainable Development ," natural resources forum , Vol. 16 , No.1, pp-3-10.

[20] Planning Commission (2012), "Sustainable development Emerging Issues in India's Mineral Sector", retrieved from http://planningcommission.nic.in/reports/sereport /ser/isid_mining%20_report1206.pdf , accessed on 4 -05-2012.

[21] PDAC (2013), "Investment Opportunities in the Mining Sector", retrieved from http://mines.nic.in/writereaddata%5CContentlinks%5C024d000e9d494ed19d7d0b1962e8b3d8.pdf , accessed on 3-05-2012.

[22] Robinson, JG, Francis, G, Legge, R, and Lerner, S (1990), "Defining a sustainable society: values, principles, and definitions," Alternatives, Vol. 17, No.2, pp:36–46.

[23] Schaltegger ,(2003) ,"stakeholder-Beziehungen and reputation in basler zeirung, 3rd march, 2003,15.

[24] Water Act (1947), retrieved from http://www.vanashakti.in/environment_protection.html , accessed on 10-05-2013.

[25] White A (2006), "Why we need global standards for corporate disclosure", Law and Contemporary Problems, Vol. 69, No.167, pp .167-186.