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# GONDWANA

A JOURNAL OF INDIAN INSTITUTE OF COAL MANAGEMENT

तेजस्विनावधीतमस्तु मा विद्विषावहे



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# GONDWANA

A JOURNAL OF INDIAN INSTITUTE OF COAL MANAGEMENT

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## Coal India Ltd- The Best Public Sector Undertaking of India

Sri U. Kumar\*

Right since 1971 – 1973, when the Indian Coal Industry was nationalised and Coal India Limited was formed, the Indian Coal Sector has operated in a regulated regime where the Coal prices are fixed by the Government, they were kept in most cases, even lower than the cost of production of coal and budgetary support was made available for meeting the capital requirement of Coal India Limited.

With the liberalisation of Indian economy in 1991-1993, Coal India was given some limited flexibility in respect of Coal price fixation but Budgetary support was withdrawn. Despite this Coal India not only managed to survive but also became financially healthy and met the country's coal demand in full right till the close of the century. By this time, it had brought the country's coal production from about 70 million tons at the time of nationalisation to about 300 million tons by 1999-2000, but instead of earning kudos for this splendid performance, CIL continued to be a butt of criticism on sometimes justified, but majority of the times on imaginary grounds.

Economic liberalisation in 1993 opened Coal Sector, albeit partially, to both Private and Public Sector companies for meeting their captive Coal requirement. In the process, 218 Coal Blocks having total geological reserves of more than 101 billion tons were allotted for captive mining, which were expected to produce more than 300 million tons by the terminal

year of 11<sup>th</sup> Five Year Plan i.e. 2011-12. Out of these, for various reasons, and most of them not attributable to the Block allocatees, just about 25 blocks came into production. Even in 2014-15 when operation of captive coal mining blocks was stopped, consequent upon cancellation of the allocation as per the orders of Hon'ble Supreme Court, the production level that had been achieved by the Captive Sector was only about 60 million tons, including the production from TISCO, IISCO and DVC, who were allowed to retain their coal mines when the nationalisation of coal sector took place. If, only the Blocks allocated in terms of the new Captive Mining Policy of 1993 are taken into account, their total production was only 38 million tons. During this entire period of 1993-2014/2015, captive mining sector continued to fail, but Coal India continued to grow steadily at about 4-5%.

It is only after, the dawn of the new Century i.e. after 2000, that Coal India's efforts to bridge the gap created by the failure of captive sector, started proving to be inadequate, and the country started facing the shortage of coal. During this entire period however, it was Coal India which got the blame for the failure of Captive Sector.

This should have been a time for introspection by the highest policy maker bodies of the nation, so that the reasons for failure of Captive Sector could be ascertained, and corrective measures could

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be taken. Instead, the country remained satisfied, by criticising Coal India and resorting to Coal import for bridging the gap between the Demand and the Domestic production. This was the time when the realisation should have dawned that the country's systems and procedures were not designed for achieving fast build-up of Coal production. Opening of a new mine, was taking as much as 6-7 years, Forest clearance and Environment clearance was taking 4-5 years and Land Acquisition & R&R were problems for which the coal companies had to depend on their own devices, with obstructions from all quarters and no assistance from the State Governments.

Unfortunately, this situation continues even today and if anything Land Acquisition and R&R have become more difficult. The Coal Mines (Special Provisions) Act 2015 raised great hopes that the new system of allocation of Coal Blocks through Auction route would pave the way for speedy opening of new Coal Mines and faster build-up in Coal production. How far these expectations have been met, will be evident from the fact that Coal production from Blocks allocated through Auction route, and including Tata Steel, IISCO (now Steel Authority of India Ltd), and DVC, has come down from about 60 million tons in 2014-15 to 38 million tons in 2015-16, 39 million tons in 2016-17 and 37 million tons in 2017-18. This of course does not take into account about 16 MTY of Coal production from the Coal mine in Singrauli Coalfield allotted to Sasan, UMPP.

But in spite of all hurdles, Coal India has continued to march forward, increasing the

production from 462.53 million tons in 2013-14 to 494.24 million tons in 2014-15, 538.75 million tons in 2015-16, 554.14 million tons in 2016-17, 567.37 million tons in 2017-18 and 606.9 million tons in 2018-19. In the process, CIL achieved a remarkable growth rate of 6.8% in 2014-15 and 9% in 2015-16. This was no doubt possible because of some effective assistance that CIL received from the concerned State Governments, thanks to the prodding from Ministry of Coal, but that Coal India is capable of delivering has got clearly established in the country. Unfortunately, this growth rate could not be maintained in 2016-17 & 2017-18 but this was on account of drop in Coal demand, and when demand picked up in 2018-19, growth rate of Coal India has become 7%.

It will also be relevant to add here, that Indian Coal Sector was asked to get ready for production level of 1500 million tons by 2020, out of which while Coal India and Singareni were supposed to produce 1000 million tons, the Captive Sector was to contribute 500 million tons. The fact that Coal India has continued to grow while Captive Sector has remained stagnant should be a clear pointer to where the failure lies. Unfortunately, the critics found it more convenient to criticise Coal India instead of taking the trouble of identifying the reasons for Captive Sector's failure and taking remedial measures.

2018-19 started with a dramatic turn in the Power Situation, while Hydel generation went down and Nuclear remained more or less stagnant, the entire shortfall caused by drop in Hydel

generation, which was of the order of 24% had to be made up by coal based generation for meeting the growing power demand of the nation.

This resulted in unforeseen increase in Coal demand and it got accentuated by the following:

1. Some Mega Power Projects like Tata's and Adani's at Mundhra which have the total capacity of 4000 MW, came to almost total stand still on account of heavy losses that they started incurring consequent upon heavy increase in Coal prices in Indonesia from where they were getting their Coal supply. This loss in generation capacity had to be made up by other Power Stations which were getting their coal requirement from Coal India Limited and naturally Coal demand shot up to the extent.
2. Coastal Power Stations which were also dependent on imported Coal, either scaled down their generation activity or else started looking for more supplies from Coal India sources, so that they could minimise the impact of heavy increase in imported coal prices.
3. Cement and other consumers in non-

metal sector, which were living on Imported Coal, started turning towards Coal India for containing the impact of heavy increase in imported coal price.

4. Most of the Captive Blocks which were already operational and which had been allocated on the basis of Auction, and were therefore, supposed to come into production immediately, could not do so on account of regulatory problems like execution of lease Deed and transfer of clearances. The linked industries therefore started looking towards Coal India and demand on Coal India therefore shot up.

All these factors combined led to a situation where demand on Coal India had gone up much beyond what had been planned.

It has to be appreciated that production from existing mines cannot be increased at short notice and opening of new mines takes 6-7 years. Despite this, Coal India took up the challenge, and the production growth that it achieved month after month, in the financial year 2018-19 clearly established the effective manner in which CIL is proceeding for the energy security of the country.

Month	Production in Million Tons	Offtake in Million Tons	Supply to Power Sector in Million Tons
Apr-18	44.84	50.97	40.30
Apr-17	38.44	45.10	35.20
Growth(%)	16.64%	13.01%	14.48%
May-18	47.14	52.86	41.70
May-17	40.74	46.41	36.20
Growth(%)	15.70%	13.90%	15.19%
Jun-18	44.88	49.59	39.80
Jun-17	39.66	45.80	35.10
Growth(%)	13.10%	8.20%	13.50%

Month	Production in Million Tons	Offtake in Million Tons	Supply to Power Sector in Million Tons
Jul-18	40.56	48.85	39.5
Jul-17	36.64	44.30	34.1
Growth(%)	10.60%	10.27%	15.90%
Aug-18	38.80	45.22	36.70
Aug-17	36.62	43.70	34.20
Growth(%)	3.14%	3.47%	7.30%
Sep-18	40.24	43.90	35.1
Sep-17	38.77	43.57	35.4
Growth(%)	3.79%	0.76%	-0.90%
Oct-18	49.77	50.00	49.80
Oct-17	46.15	48.28	46.20
Growth(%)	7.80%	3.56%	7.79%
Nov-18	52.09	51.01	42.50
Nov-17	51.26	50.71	41.10
Growth(%)	1.60%	0.59%	3.40%
Dec-18	54.13	52.77	42.40
Dec-17	54.63	53.44	41.60
Growth(%)	-0.91%	-1.25%	1.92%
Jan-19	57.20	52.44	41.70
Jan-18	56.68	53.67	40.50
Growth(%)	0.91%	-2.29%	2.96%
Feb-19	58.05	51.45	40.00
Feb-18	54.48	49.94	37.70
Growth(%)	6.55%	3.02%	6.10%
Mar-19	79.20	59.60	46.10
Mar-18	72.30	55.30	42.70
Growth(%)	9.54%	7.77%	7.96%
<b>2018-19</b>	<b>606.90</b>	<b>608.10</b>	<b>488.00</b>
<b>2017-18</b>	<b>567.40</b>	<b>580.30</b>	<b>454.20</b>
<b>Growth(%)</b>	<b>6.96%</b>	<b>4.79%</b>	<b>7.44%</b>

While Coal India has achieved highest ever growth rates in April 2018 & May 2018, growth trajectory was maintained even during monsoon, when production from opencast mines invariably goes down. It is pertinent to mention that close to 95% of Coal India's production comes from Opencast Mines. Thus, CIL deserves appreciation of the country for its phenomenal performance in 2018-19.

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Going forward, it is certain that CIL will overcome the challenge of Coal Shortage and will continue to be an effective partner in the economic growth of the nation and will surely continue to provide the much needed energy security to the nation.

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# Human Resource Accounting

Ms. Pragyan Pushpanjali\*

## Introduction

It has now become an established fact that Human Resources that is - “Men” are the most important ‘M’ of production out of the other Ms viz – Machines, Materials, Money, Markets and Methods. It is after all the Human Resources i.e Men- the 6<sup>th</sup> M, who manage and control the other Ms. Therefore the utilization and value addition of the other Ms depend on these Human Resources. It is therefore ironical that while the Ms like machine, materials and money find their place on the asset side of the balance sheet, expenditure on remuneration and training of human resources are placed on the liabilities’ side.

Managers are often heard saying “Employees are our most important asset.” Yet beneath the rhetoric, these same managers consider and manage HR as cost and not as asset. But keeping in mind that people are the only source of long-term competitive advantage, such a proposition is dangerous. Companies that fail to invest in employees jeopardize not only their own success but most importantly, even their own survival.

Any asset should have three characteristics:

- a) long term value or benefit
- b) should be owned and controlled by the firm
- c) its future value should be monetizable (expressable in monetary terms).

The fact that human beings cannot be owned and controlled by the firm because they enjoy free will as against the other resources, is the first obstacle in considering Human Resources as assets.

The second objection arises from the fact that their worth cannot be measured in quantifiable terms. Human Resource Accounting tries to offer a solution to this problem. Human Resource Accounting is identifying the data related to Human Resources and communicating this data to interested stakeholders. It involves treating Human Resources as assets and calculating the cost and value of the same. Some models also try to mitigate the first problem by including in their calculation of the worth of Human Resources, the probability of their leaving the firm. This treatment then makes Human Resources almost acceptable as an asset, which they actually are. Any organization which does not treat its Human Resources as Assets is doomed to suffer and its existence itself is jeopardized. Therefore, Human Resource Accounting is of great significance in today’s organizations and more in times to come because, with the onset of the knowledge economy, the Human Assets of any organization will be the ones to decide and write the success story of the organization, irrespective of the type of organization.

Until recently, there were no robust methods for measuring the contributions of investments in human capital management (HCM) — meaning to say

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that things like leadership development, job design, and knowledge sharing were things that were not quantifiable or measurable. That has now changed.

*Human Resource Accounting (HRA) involves accounting for expenditures related to human resources as assets, as opposed to traditional accounting, which treats these costs as expenses that reduce profit. Interest and contributions to growth in Human Resource Accounting have been evident in a number of countries and the growing interest and awareness in this area lends support to the possibility that future financial reports may include non-traditional measurements such as the value of human resources using HRA methods.* (Malayendu, 2011)

Human Resource Accounting is important in two ways. One way that, measurement reflects the strategic and competitive importance of human resources, and the second suggests that, to earn credibility, human resources must be expressed in financial terms.

Human Resource Accounting is the process of identifying and reporting the investments made in the human resource of an organization that are presently not accounted for in the conventional accounting practices.

Human Resource Accounting has been defined by American Accounting Association's Committee as "the process of identifying and measuring data about human resources and communicating this information to interested parties." (Bhavin, 2012)

According to Eric G. Flamholtz, "Human Resource Accounting represents accounting for people as an organizational

resource. It is the measurement of the cost and value of people for the organization." (Flamholtz E. , 1999)

Human Resource Accounting (HRA) involves accounting for the company's managers and employees as human capital: something that will give long term benefit. In the Human Resource Accounting approach, therefore, all expenses related to human resources are treated as assets and therefore put on the assets side of the balance sheet as against the traditional treatment where they were treated as costs and put on the expenses side on the income statement. Such expenses were seen to reduce profit.

Sir William Petty was perhaps the first person to make an attempt to signify the HR accounting in around 1691. He treated the labor as the generators of wealth. Even Adam Smith had recognized the investment on human resources. The post 1960's witnessed a significant development of business people joining hands with the academicians to evolve suitable methods to account for human resources. Consequently, a number of models or approaches have been developed and suggested for the measurement and valuation of human resources. These approaches may broadly be classified into two types:

1. HR Cost Accounting (HRCA)
2. HR Value Accounting (HRVA)

HR Cost Accounting (HRCA) may be defined as the measurement and reporting of the costs incurred to acquire and develop people as organizational resources. It deals with accounting for investments made by an organization for the acquisition and development of human

resource as well as the replacement cost of the people presently employed.

HR Value Accounting (HRVA) is the concept based on the view that difference in present and future earnings of two similar firms is due to the difference in their human capital or assets. The economic value of the firm can be determined by obtaining the present value of future earnings.

A number of valuation models have been developed for determining the present value of future earnings.

Some of the common models used for HRA are as follows: depending on the treatment they can either be classified as HRCA or HRVA model.

**Methods of Human Resource Accounting**

**a) Acquisition Cost Approach**

This approach was developed by Brummet, Flamholtz and Pyle. This method uses five parameters to measure the organization’s investment in employees, which are as follows:

- a) Recruiting, acquisition;
- b) Formal training and, familiarization;
- c) Informal training, Informal familiarization;
- d) Experience and
- e) Development

The process of giving a status of asset to the expenditure item is called capitalization and in this model the cost on Human Resources is amortized over a period of time. “So here one will take

the age of the employee at the time of recruitment and at the time of retirement. Out of these a few employees may leave the organization before attaining the superannuation. This is similar to a physical asset e.g.: If company spends one lakh on an employee recruited at 25 years, and he leaves the organization at the age 50, he serves the company for 25 years (his actual retirement age was 55 years). The company has recovered rupees 83333.33 so the unamortized amount of rupees 16666.66 should be charged to profit & loss account i.e.

$$100000 \div 30 = 3333.33$$

$$3333.33 * 25 = 83333.33$$

$$100000 - 83333.33 = 16666.67$$

(SCRIBD)

This method is the only method of human resource accounting which is based on sound accounting principles and policies.

**Limitations**

The valuation method is based on false assumption that the currency is stable.

- Since the assets cannot be sold there is no independent check of valuation.
- This method measures only the costs to the organization but ignores completely any measure of the value of the employee to the organization

It is too tedious to gather the related information regarding the human values. (SCRIBD)

**b) Replacement Cost Method**

This approach measures the cost

of replacing an employee. According to Likert (Likert & Bowers, 1973) replacement cost include recruitment, selection, compensation, and training cost (including the income foregone during the training period). The data derived from this method could be useful in deciding whether to dismiss or replace the staff.

### Limitations

“Substitution of replacement cost method for historical cost method does little more than update the valuation, at the expense of importing considerably more subjectivity into the measure. This method may also lead to an upwardly biased estimate because an inefficient firm may incur greater cost to replace an employee.” (Srikanth.P & Shenoy, 2010)

#### c) Ravindra Tiwari’s Model on Human Resource Accounting

This model prescribes Human resource accounting approach for two categories of Employees.

- Employees, who are at strategic key decision making position such as MD, CEO (Top Executives)
- Employees, who execute the decision taken by top executives

Model arrives at the value of Human Resources as sum of the following three parts

- Real Capital Cost part
- Present value of future salary/wages payments
- Performance evaluation part

### Limitations

1. Calculation process is lengthy and complicated.
2. Since this incorporates the features of Lev and Schwartz Model, the drawbacks of this model are inherent in this model as well. (Srikanth.P & Shenoy, 2010)

Ravindra Tiwari has given another model based on performance appraisal parameters.

#### d) Lev and Schwartz: Present Value of Future Earnings Model

This method helps in finding out what the future contribution of an employee is worth today, based on the present value of future earnings, adjusted for the probability of employees’ death/separation/retirement. According to this model, “the value of human capital embodied in a person of age T is the present value of his remaining future earnings from employment”.

= The Human Capital Value of a person ‘ ‘ year old

T = The person’s retirement age

I(t) = the person’s annual earnings up to the retirement

t = retirement age

R = A discount rate specific to the organization (it is called the rate of discount or rate of interest at which the firm wants to discount the future incomes into present value)

According to this model, the value of human resources is ascertained as follows :

1. All employees are classified in specific groups according to their age and skill.
2. Average annual earnings are determined for various ranges of age.
3. The total earnings which each group will get upto retirement age are calculated.
4. The total earnings calculated as above are discounted at the rate of cost of capital. The value thus arrived at will be the value of human resources/assets.

This model is very popular and accepted by many organizations. In this model human resources are valued by considering future earnings, service life of an employee, discount rate and present age of an employee. The weaknesses of this model are as follows:

- i) It ignores the effect of seniority and also ignores the change in the role of an employee.
- ii) It does not consider the possibility of early leaving the organization by an employee.
- iii) It ignores the factor of bargaining.
- iv) The measure assigns more weight to averages than to the value of any specific group or individual.” (Lev & Schwartz, 1971)

However, this measure is an objective one because it uses widely based statistics such as census income return and mortality tables.

#### e) **Value to the organization/ Competitive Bidding Model**

Hekimian and Jones (1967) proposed “that where an organization had several divisions seeking the same employee, the employee should be allocated to the highest bidder and the bid price incorporated into that division’s investment base. For example a value of a professional athlete’s service is often determined by how much money a particular team, acting in an open competitive market is willing to pay him or her”. (Hekimian & Jones, 1967)

#### **Limitations**

- The soundness of the valuation depends wholly on the information, judgment, and impartiality of the bidder. (Bhavin, 2012)

#### f) **Expense model**

Mirvis and Macy’s model “focuses on attaching dollar estimates to the behavioral outcomes produced by working in an organization. Criteria such as absenteeism, turnover, and job performance are measured using traditional organizational tools, and then costs are estimated for each criterion. For example, in costing labor turnover, dollar figures are attached to separation costs, replacement costs, and training costs”. (Mirvis & Macy, 1976)

#### **Advantages of Human Resource Accounting :**

Human Resource Accounting has three major functions (Flamholtz, Bullen, & Hua, 2002):

- a) Providing numerical information

about cost value of people as organizational resources.

- b) Serving as an analytical framework to facilitate decision making.
- c) Motivating decision makers to adopt a Human Resources' perspective.

Human Resource Accounting therefore can be said to have the following benefits:

1. It helps in proper employment and utilization of human resources
2. Aids decisions like transfers, promotion, training and retrenchment of human resources
3. Provides a basis for planning and balancing decisions between physical assets and human resources.
4. It helps in finding out the expenditure on Training and Development and the benefits reaped from them.
5. It helps to identify the causes of high turnover rates and identify the causes.
6. It helps in identifying the real cause of low return on investment.
7. It provides information to persons interested in making long term investments in the firm like bankers, investment houses and also gives information to other interested parties like board of directors
8. It helps the employees in improving their performance and bargaining power and in assessing expenditure incurred on each employee and his contribution.

9. Human Resource Accounting helps to provide a complete picture of the firm and give the true value of the firm and the rate of return on actual investment. This facilitates objective comparison between firms.

### **Drawbacks of Human Resource Accounting and its Methods:**

Human Resource Accounting treats Human Resources as assets. According to the definition of 'Assets' given by experts, any asset has got 3 features which are as follows:

- a) Long term value or benefit
- b) Should be owned and controlled by the firm
- c) Its future value should be monetizable, that is, it should be capable of being expressed in monetary terms.

The problem with treating Human Resources as assets arises partly because of the third point and mostly because of the second point mentioned above. The methods of Human Resource Accounting can be broadly categorized into two: Historical cost based methods and Value based methods. Both these methods have inherent draw backs as discussed below.

Human Resources cannot be said to be owned and controlled by the firm. There is always a probability of employee turnover for reasons varying from dismissal, voluntary retirement, quitting for other jobs to death. Value based models try to resolve this to some extent by taking into account the probability of their quitting while quantifying the value. However, the fact remains that it is only the probability of turnover which we consider, which is

an estimated number and not an absolute value and the problem is only marginally catered to.

The subjectivity associated with the calculation process remains another major drawback of Human Resource Accounting. Generally Accepted Accounting Principles (GAAP) encourage objective, reliable and verifiable measurements so that comparability is easier and therefore some standards will have to be laid down for Human Resource Accounting as well. Historical Cost methods of Human Resource Accounting try to do away with this short-coming, but they suffer with the above mentioned problem of not accounting for the probability of the turnover.

These are the inherent shortcomings which remain to be resolved.

### **Current Scenario and Concluding Remarks:**

In India most of the enterprises which follow Human Resource Accounting, do it voluntarily, and most spare a separate section in their annual reports for a detailed account of their human resources. Human asset reporting in India usually includes a profile of human assets, the compensation pattern, training and development, human asset productivity, human asset value, and the total wealth of the organization. In every business concern, physical assets as well as human resources are required for its success. Physical assets like plants, machinery, building etc. are unproductive without human resources. In the present context, most of the organizations have realized that human resources are their most precious resources. Therefore,

they have not only taken measures to develop their human resources but also taken measures to value these resources. This is happening throughout the world including India.

Many Indian companies have taken steps for the valuation of their human resources. The concept of human resource accounting was first incorporated by Bharat Heavy Electrical Ltd. (BHEL), a leading public sector enterprise, during the financial year 1973-74. Later, it was adopted by other leading public and private sector organization in the subsequent years. Some of these organizations are Oil and Natural Gas Commission (ONGC), Minerals and Metal Trading Corporation of India (MMTC), Steel Authority of India Ltd (SAIL), National Thermal Power Corporation (NTPC), Engineers India Ltd. (EIL), Hindustan Machine Tools Ltd. (HMTL), Cochin Refineries Ltd. (CRL), Madras Refineries Ltd. (MRL), Associated Cement Company Ltd. (ACC), Infosys Technologies Ltd. (ITL) and many more. Human Resource Accounting seems to have a bright future not only in other countries across the world but also in India.

The *challenges and hurdles* that come in the path of Human Resource Accounting in India and across the world are basically the following:

- 1) The absence of a standardized and universally accepted method of Human Resource Accounting - This is very much required if subjectivity has to be removed and uniformity has to be ensured across the various companies world-wide.
- 2) The existing methods are either complex or overlook important

aspects like – performance, skill, qualifications, attitude, health (mental and physical), attrition rate etc. of the employees, and are therefore not acceptable & valid objections are raised in their implementation.

- 3) The lack of statutory binding to include Human Resource Accounting in the annual reports of companies leads to reluctance and apathy towards Human Resource Accounting practices and also research in this field.

If the above hurdles are removed then a lot of progress can be anticipated in the valuation of Human Resources (and its implications) and it can have a snowball effect with great benefits to the companies and organizations as well as to the human resources employed therein.

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# Implementation & Monitoring of compliance of Environment Clearance conditions of Coal mining Projects

Dr Manoj Kumar<sup>1</sup>, Ms. Sangeeta<sup>2</sup>, Dr R Dwivedi<sup>3</sup>

(above in brackets to be put at end of first page)

## Abstract

This research paper is based on the analysis of six different sets of environmental clearance conditions for six mining complexes located in two coalfields namely North Karnpura Coalfield and Jharia Coalfield situated in Jharkhand state. Altogether 399 conditions relating to 268 of general and 131 of specific in nature imposed by MoEFCC while granting environmental clearance to particular project. The result of the f-n-p analysis reveals that 61% of the stipulated conditions were grouped in “f”, 20% in “p” and 19% in “n”. f-n-p analysis after confronting auditing by established firm were found to be in 84% in “f”, 12% in “p” and 4% in “n”. This study also stipulates two ways of dealing with EC conditions while making compliances –Direct (Segregation) and indirect method (compliance of other statutory obligation). Direct method deals with issues related with Air (24%), Water (31%), Noise (6%), Land (13%) and others (26%). This study recommends putting stress on 39% issues falling in “p” & “n” category. Improvement in compliance status will come from these categories, 20% from “p” and 19% from “n”.

Sectoral wise release of standard environmental conditions by MoEFCC

vide OM No. F. No. 22-34/2018-IA. III dtd, 9.8.18, 9.11.18 and 4.1.19 for different sector including opencast coal mine, underground coal mine and coal washeries has given a tool to project proponent (PP) of coal company (CC) for smooth compliances of the EC conditions.

Keywords: f-n-p, Compliance, Condition, direct, Indirect

## 1.0 Introduction

Ministry of Environment, Forest and Climate Change (MoEF&CC) is the nodal agency for planning, promoting, coordinating and overseeing of the implementation of India’s environmental and forestry policies and programmes. In recognition of the need for environmental protection, the MoEF&CC has taken various regulatory and promotional measures. Mining of coal is to be carried out in conformity with the stipulated environmental standards as prescribed under the relevant Acts and statutes. Accordingly, for new and existing mines (involving capacity augmentation), Environment Impact Assessment and Environment Management Plan (EIA-EMP) are to be prepared. EIA highlights the beneficial and adverse effects of coal mining on the environmental system. EMP details all mitigation measures to be undertaken for item-wise activity during the construction, operation and the entire

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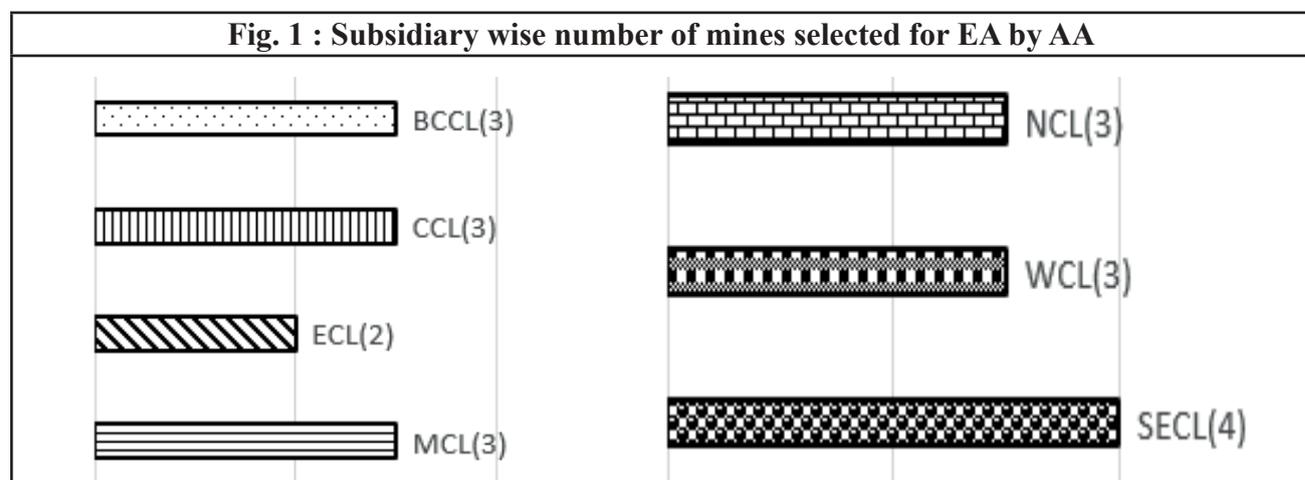
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life cycle of the coal mines to minimize adverse environmental impacts. EIA-EMP formulated as per the approved Terms of Reference (ToR) and public consultations, are the prerequisites for obtaining Environment Clearance (EC) from the MoEF&CC. Wherever mining involves forest land, Forest Clearance (FC) is required to be obtained from the MoEF&CC for diversion of forest land for non-forest purposes.

20 different coal mines of coal India Limited were selected for Environmental Auditing (EA) by Indian Council of Forest Research Institute (ICFRE), Dehradun, the Auditing Agency (AA). This auditing may

help in implementation & monitoring of compliance of Environmental clearance conditions of Coal mining projects. The different mines (Fig 1) includes Tetulmari, GKKC, NT-ST Jeenagora of Bharat Coking Coal Limited (BCCL), Piparwar, Ashok, Rohini of Central Coalfields Limited (CCL), Rajmahal, Sonapur-Bazari of Eastern Coalfields Limited (ECL), Lakhanpur, Samleswari, Bhubaneswari of Mahanadi Coalfields Limited (MCL), Nigahi, Jayant, Amlohri of Northern Coalfields Limited (NCL), Kamptee Deep, Ukni Deep of Western Coalfields limited (WCL) and Gevra, Dipka, Kusmunda, Manikpur of South Eastern Coalfields Limited (SECL).



Scope of Work of Audit Agency (AA) were to workout for Coal Company related to implementation & monitoring of environmental clearance conditions along with other jobs as under :

- To review conditions laid down in the Environmental Clearance approved for mitigation of environmental pollution.
- To assess the compliance with the project approval conditions and other approval of the mines vis-à-

vis progress of development of the mine.

- To conduct site inspection, verify the existing levels of pollution vis-à-vis the laid down standards, review on site documentation, monitoring data, mechanism in place for sampling and analysis that are relevant to the audit.
- Discussion /consultation with concerned project staff on the development consent, other approval condition, infrastructure and operation

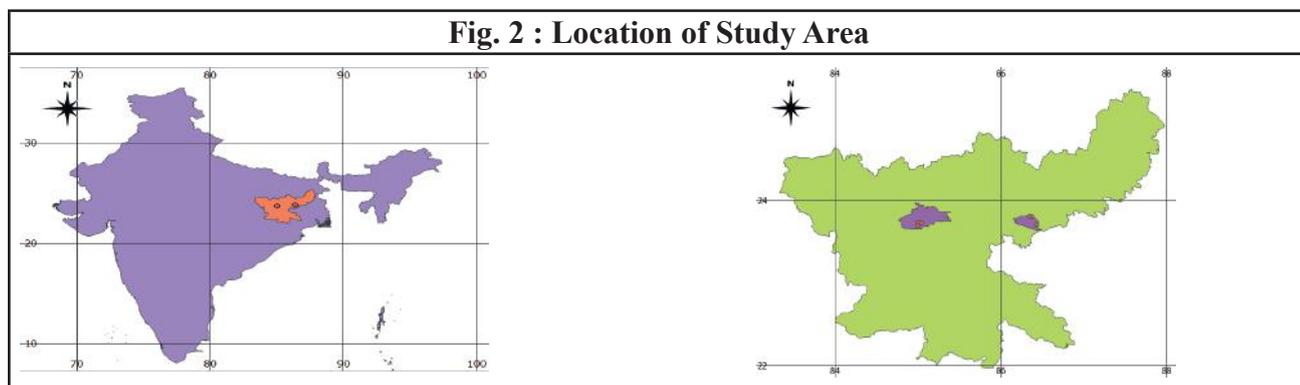
to comply the Environmental Clearance.

- To assess environmental performance based on the development with the requirements of the approval of the Environmental Clearance and mining lease conditions (including any assessment, plans or programs required under these consents/ approvals)

### 1.1 Environmental Clearance:

Central Government (CG) vide Environment Impact Assessment (EIA) notification 2006, SO 1533 directs that construction of new projects or activities or the expansion or modernization of existing projects or activities listed in the Schedule to EIA notification 2006, entailing capacity addition with change in process and or technology, any change in product – mix, in an existing manufacturing unit, shall be undertaken in any part of India only after the prior environmental clearance from the Central Government (CG) or as the case may be, by the State Level Environment Impact Assessment Authority, duly constituted by the Central Government under sub-section (3) of section 3 of Environment (Protection) Act, 1986, in accordance with the procedure specified in the notification.

### 3.0 Study Area

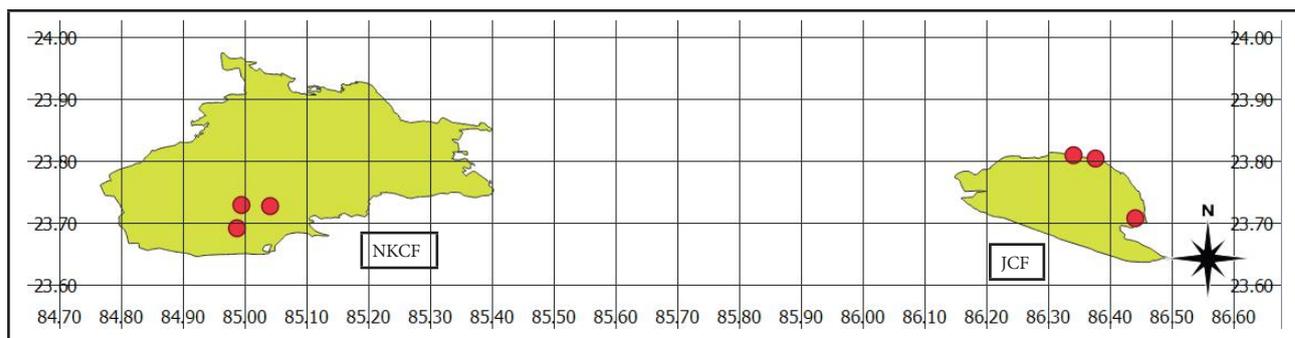


### 1.2 Compliance:

Compliance to the condition stipulated in the Environment clearance issued from Ministry of Environment, Forest and Climate Change (MoEFCC) / State Environment Impact Assessment Authority (SEIAA) is to be submitted by user agency on six monthly basis. The six monthly compliance report is to be submitted on or before 1<sup>st</sup> June and 1<sup>st</sup> December for the period from October – March and April – September respectively. After the release of standard format for Environmental clearance condition for opencast coal mine, underground coal mine, coal washeries, along with other sector vide MoEFCC OM no. F. No. 22-34/2018-IA.III dtd. 09.08.18, has released some pressure has been lessened from the project proponent of the coal company (CC) in implementing the Environment Clearance (EC) conditions. As Coal Company (CC) knows well in advance the pattern of Environment Clearance (EC) conditions, and they therefore can plan before hand during project planning stage.

### 2.0 Objective

The objective of this study was to find the method for improving implementation and monitoring of compliance of EC conditions of coal mining project imposed by MoEFCC, GOJ, India while granting EC to coal mining projects.



For convenience and availability of data and responses, six number of mining complexes viz, Mining Complex 1 (MC1), Mining Complex 2 (MC2), Mining Complex 3 (MC3), Mining Complex 4 (MC4), Mining Complex 5

(MC5) and Mining Complex 6 (MC6) were chosen for this study. These mining complexes are located in Chatra, Ranchi and Dhanbad district of Jharkhand (Fig 2). The location details are tabulated at table 1.

**Table 1 : Details of Mining Complexes**

Mining Complex	Case no.	EC capacity in MTPA	Latitude	Longitude	Condition		
					Specific	General	Total
MC1	1	J-11015/610/2007-I.A II (M) 30.03.16	23.7297	84.9942	8	41	49
MC2	2	J-11015/76/2013-I.A II (M) 20.05.14	23.7283	85.0403	61	19	80
MC3	3	J-15011/227/2007 -IA.II(M) dtd. 21.02.17	23.6917	84.9878	48	21	69
MC4	4	J-11015/307/2010-IA.II(M) dtd. 21.05.13	23.7092	86.4411	49	19	68
MC5	5	J-11015/183/2011-IA.II(M) dtd. 26.08.13	23.8041	86.3773	45	19	64
MC6	6	J-11015/01/2011-IA.II(M) dtd. 11.02.13	23.8100	86.3400	50	19	69
Total					261	138	399

#### 4.0 Material and Methodology

All the six mining complexes chosen for study possess environment clearance certificate issued from Ministry of Environment Forest and Climate Change (MoEFCC) for 14 MTPA, 14.375 MTPA, 3.3 MTPA, 7.8 MTPA, 2.6 MTPA and 1.033 MTPA for MC 1 to MC6 respectively. Audit Agency (AA) collected responses and made

observation which were categorized in 3 categories namely Fully agreed (FA), Partially Agreed (PA) and Not Agreed (NA). These responses were based on six monthly compliances submitted by Coal Companies (CC) and the interaction made there in with Audit Agency (AA) during the audit visit.

The responses of Audit Agency (AA) were administered and analyzed over

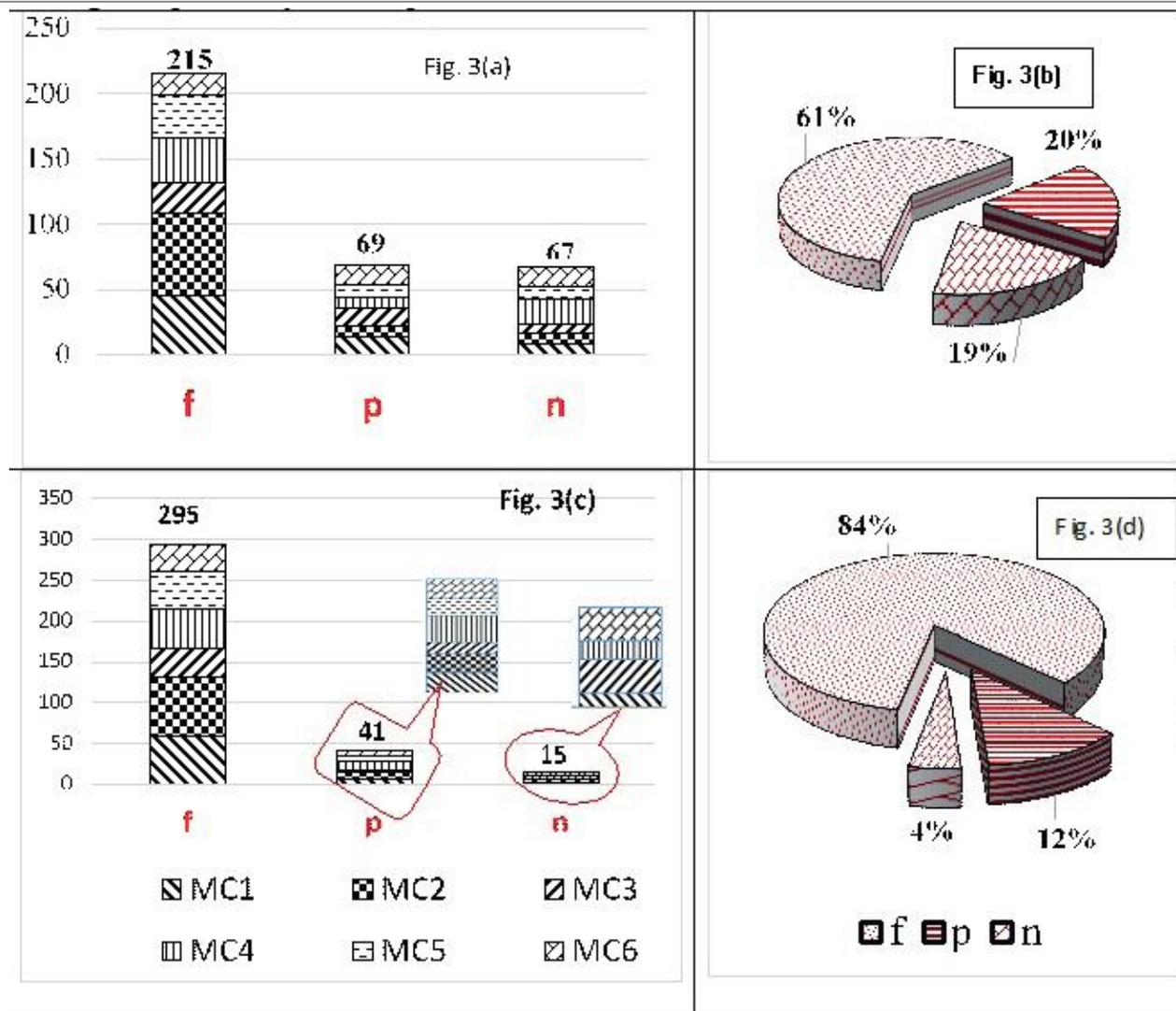
one of the group on 18<sup>th</sup> August, 2018 consisting of experts of different coal companies assembled for a training program at a leading institute of Ranchi. These responses of PA & NA were also shared and interviewed amongst different environmentalists engaged in environmental compliances in state of Jharkhand. In both type of responses the respondent were asked to further regroup the PA and NA responses of AA into FA, PA and NA. This analysis is termed as “f-p-n Analysis”

### 5.0 Result

f-p-n Analysis (Fig. 3) of total 351 distinct stipulated conditions out of 399

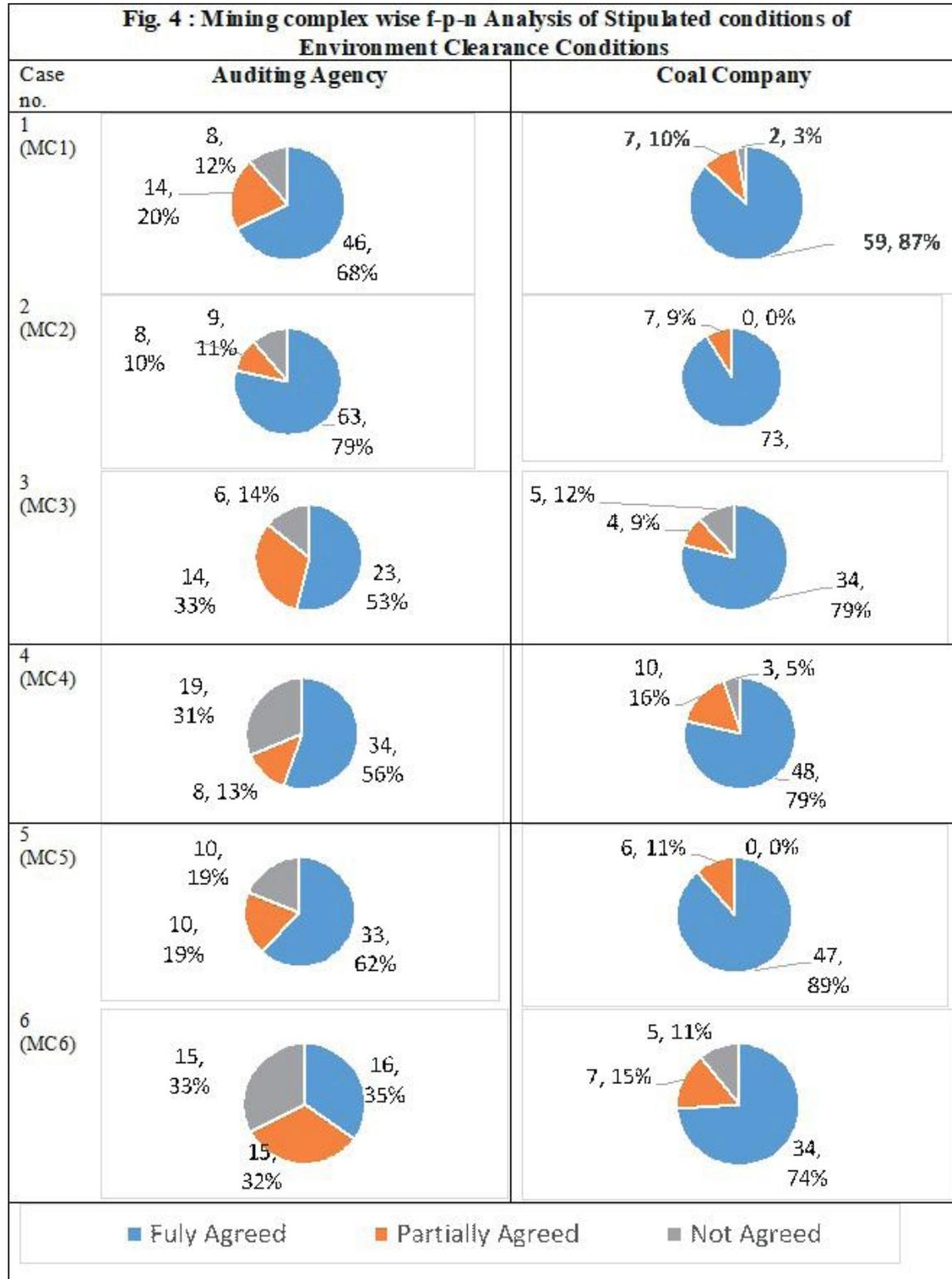
conditions for 6 nos. of Environment Clearance (EC) conditions of six mining complexes chosen for study. It was found that 61% of the stipulated conditions were grouped in FA, 20% in PA and 19% in NA category (Fig. 3b). 215, 69 & 67 numbers of conditions falls in FA, PA & NA category (fig. 3a). On administering the responses of EC condition along with responses of AA with an assumption to put their responses for PA & NA already allotted by AA. Upon compiling the responses in second stage it were found that 84% (295), 12% (41) & 4%(15) were falling in FA, PA & NA categories respectively (Fig. 3c, Fig. 3d).

**Fig. 3: f-p-n Analysis of Stipulated conditions of Environment Clearance Conditions**

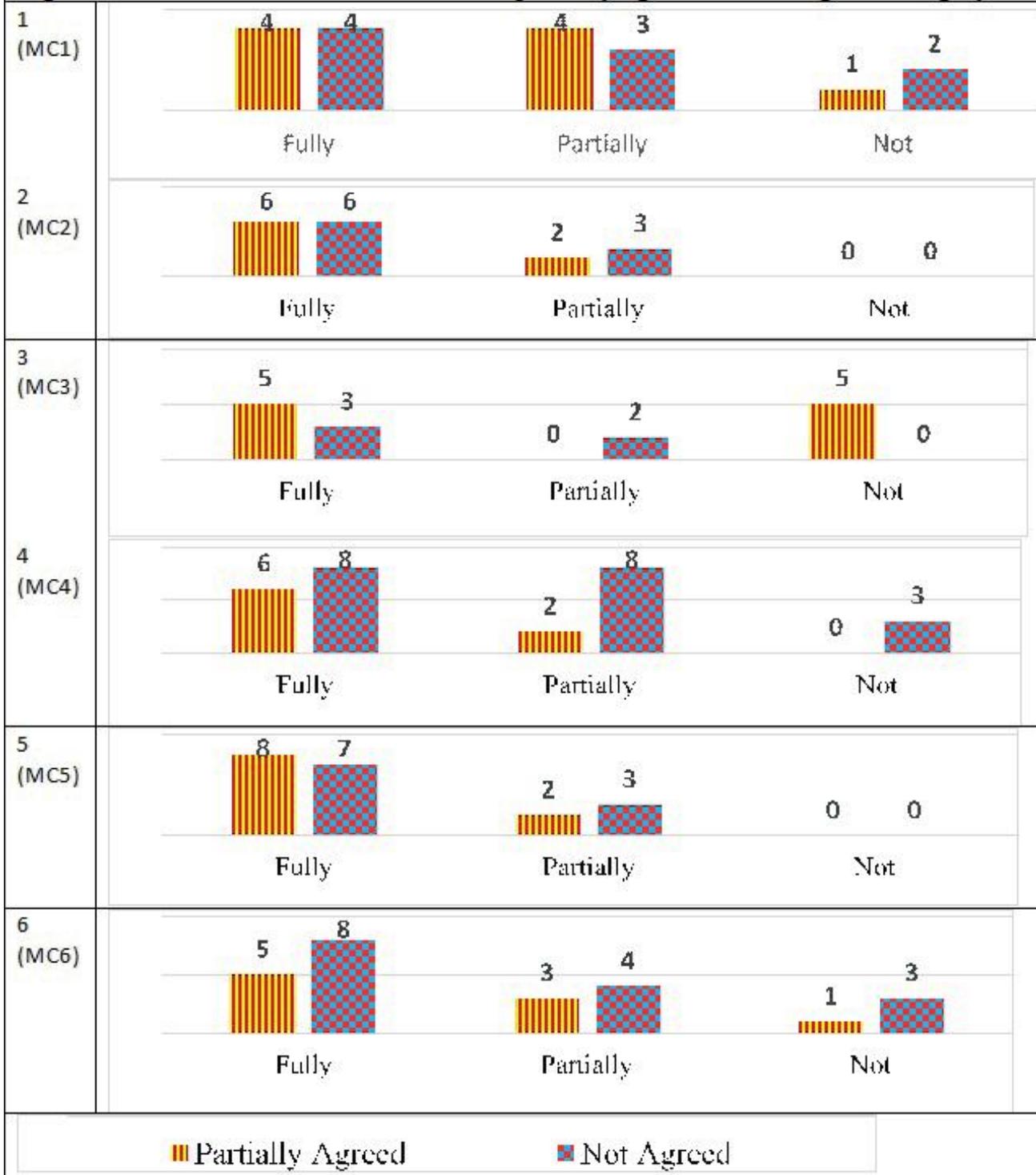


Similar exercise for the different mining complexes (Fig 4) reveals that 68%, 20% & 12% for MC1, 79%, 8% & 9% for MC2, 53%, 33% & 14% for MC3, 56%, 13% & 31% for MC4, 62%, 19% & 19% for MC5 and 32%, 33% & 35% for MC6 fall in FA, PA & NA category

respectively. Upon compiling 2<sup>nd</sup> stage responses it was found that 87%, 10% & 3% for MC1, 91%, 9% & 0% for MC2, 79%, 9% & 12% for MC3, 79%, 16% & 5% for MC4, 89%, 11% & 0% for MC5 and 74%, 15% & 11% for MC6 fall in FA, PA & NA category respectively.



**Fig 5. Distribution of conditions related to partially agreed and not agreed category.**

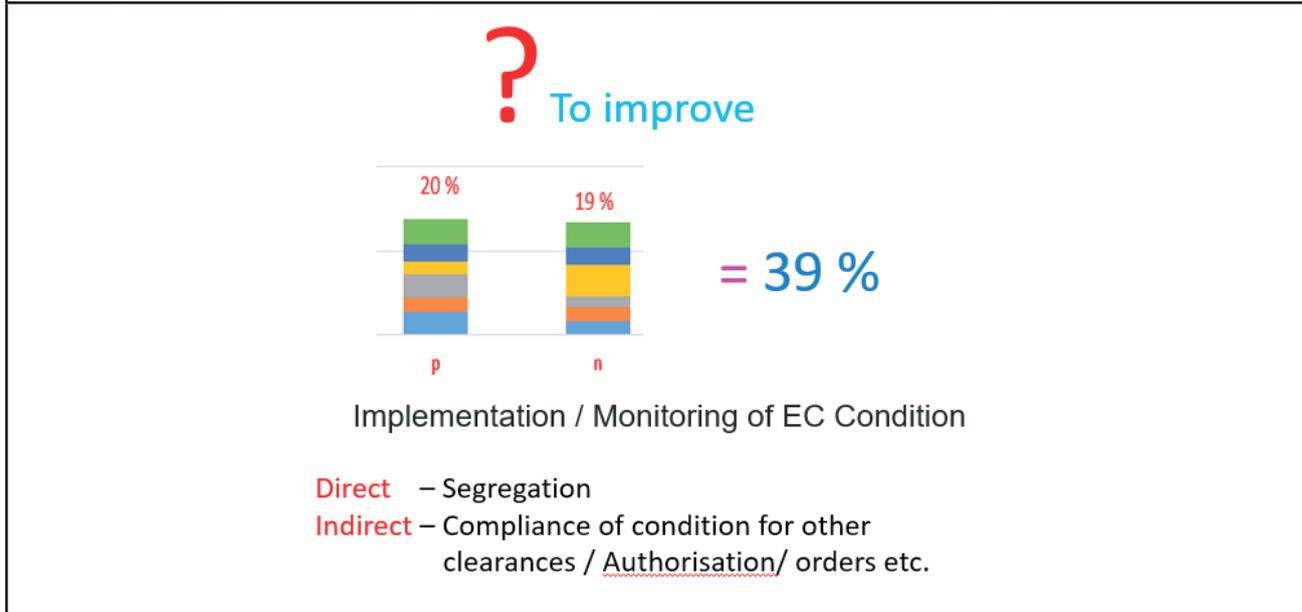


### 6.0 Interpretation

It was found that Project Proponent (PP) of Coal Company (CC) requires to improve (fig. 5) for the 39 % of the compliances made

by them of which 20% of the cases falling in “p” and 19% cases falling in “n”. Thus likely improvement will come from cases falling in “p” & “n” category (Fig 6).

**Fig. 6 : Improvement requirement for implementation / monitoring of EC condition**

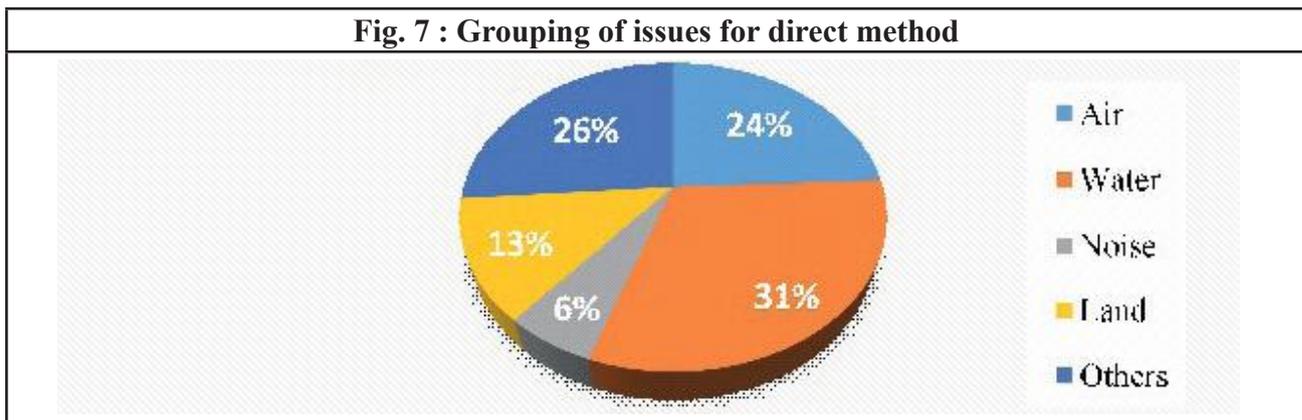


For better implementation & Monitoring of compliance of EC condition, there may be two methods. One method is direct method and other is indirect method. Direct method involves segregation of issues while indirect method may include better compliances of the conditions of other clearances/authorization, orders etc.

Direct method involves segregation of issues in which different conditions are grouped into different class based on different types of pollution, etc. These may be grouped into Air issues, water issues, Noise issues, Land issues and other issues. From the result obtained at the end of this study, it was found that contribution to the issues related to Air, Water, Noise, Land and Other are 24%, 31%, 6%, 13% and 26% respectively (Fig. 7).

### 6.1 Direct Method:

**Fig. 7 : Grouping of issues for direct method**



#### 6.1.1 Issues related to Air :

The issues related to Air pollution (24 %) under head Not Agreed (NA) & Partially Agreed (PA) includes :

- Mineralogical composition study (PM10

& 2.5) not done

- No control of fire (due to no international expertise available)
- No mechanically covered trucks & Covering of trucks

- No silo – stop payloader loading.
- Reduction in pollution load every year & Trend analysis.
- Non use of personal protective equipment.
- Permanent/ambient air monitoring is required for CO, CO<sub>2</sub>, Methane and its homologues. Presence of Aromatic compounds should be investigated as most of the aromatic compounds are carcinogenic
- Pollution Under Control (PUC) for vehicle & covering of vehicle
- Relocation of monitoring station.
- Mist type sprinklers – to curb the fugitive emissions.

### 6.1.2 Issues related to Water :

On compilation of issues related to water (31%) under Partially Agreed (PA) & Not Agreed (NA) categories, Audit Agency (AA) observed that :

- Application for ground water was not presented by Project Proponent (PP) during Audit
- De-siltation of nalla.
- Embankment along nalla
- Effluent Treatment Plant (ETP) needs upgradation
- Effluent Treatment Plant (ETP) does not exist
- Restore the flow of the rain water.
- Direct discharge of workshop water to be avoided
- Minimum specified distance from river bank (15 m)
- No proper garland / catch drains
- OB dump near nalla
- Piezo meter not installed
- Rain Water Harvesting (RWH) and water recharge structures is not being erected/

created

- Safety barrier along nallah not maintained.
- Some part of the Benti nala is diverted and no stone pitching is done
- Sewerage Treatment Plant (STP) not installed
- Retention walls and garland drains along the OB dumps and coal stacks
- Check the erosion of the sediments flow and rolling of OB waste boulders into the river by using stone pitching and grouting at the weaker areas

### 6.1.3 Issues related to Noise:

Noise related issues (6%) falling in Partially Agreed (PA) & Not Agreed (NA) categories are:

- Noise levels were not monitored on the roads, within lease or outside the lease, which carry coal to the railway siding
- Locations of the noise monitoring station - not adequately described
- No transportation within 500 m of village/dwelling

### 6.1.4 Issues related to Land & Soil :

Issues related to land and soil contribute to 16 % amongst all issues under Partially Agreed (PA) & Not Agreed (NA) categories. The stipulated conditions falling in this issue are :

- Abandoned pits to be backfilled by Overburden(OB)
- Boundary pillars with barbed wire fencing - not made all around the Mine Land
- Central recreational park with herbal gardens not constructed
- Height of OB dump exceeded
- The embankment was constructed by

- using exclusively the Over burden (OB)
- Thick green belt along township. Roadside plantation - one side or absent
- Top soil to be stacked properly

### 6.1.5 Documentation & Study report issues:

The head, other issues, further categorized into “documentation & study report” and other issues (26%) amongst all issues under Partially Agreed (PA) & Not Agreed (NA) categories. The “Documentation & Study report issues” include absence of ‘Booklet of CSR & RR activities’, ‘Documentation of skill development work’, ‘Progressive mine closure plan’, ‘Source appropriation study’, ‘Study by National Remote Sensing Agency (NRSA) to be initiated for making series map of Jharia Coal Field (JCF)’, etc..

### 6.1.6 Other Issues:

There were some issues put under head other issues. These issues includes:

- The details of CSR activities are not posted on company’s website and are also not updated
- Environment department - to include an expert of socio-economic aspect
- Higher capacity trucks not available + no silo installed
- No Independent lab for rechecking of monitoring data
- No washery & railway siding
- 10% of workers working in high coal dust prone areas for health check up from National Institute of Miners Health or any recognized agency-not being done
- Proper restoration and reclamation absent
- Public insurance liability act

- Qualified Executives at senior level not posted
- random verification of samples through analysis from independent laboratories not being done
- Separate Environment fund
- Underground mining should be taken up after completion of reclamation of Opencast mine Area after 15 years.
- X-ray machine which is obsolete and needs immediate replacement with a digital X-ray. Spirometer at this health center was found non-functional.

### 1.2 Indirect Method

Prior to establishment of the mining project, all new intending project proponents are required to obtain ‘No Objection Certificate’ (NOC) from the jurisdictional State Pollution Control Board (SPCB) in the form of ‘Consent to Establish’ (CTE). Subsequently, for carrying out operations, the units are required to obtain ‘Consent to Operate’ (CTO) from the respective State Pollution Control Boards (SPCBs). SPCBs are expected to play oversight role through periodical inspections in order to ensure compliance of standards prescribed under the Acts / statutes.

Environment Clearance (EC) letter entails to comply with the provisions of the Environment (Protection) Act, 1986 and the rules made there under. This attracts compliances of all the conditions stipulated by different statutory bodies while granting or issuing license/certificate under different rules which have been evolved by different provisions of Environment Protection Act, 1986. The different act/rules evolved from E(P) Act are:

- Bio Medical Waste (BMW) Rules
- Hazardous Wastes (HZW) Rules

Apart from above indirect conditions

of the EC conditions, User Agency (UA) have to obtain consent from their respective state pollution control Board. There are 3 types of consent issued under the provisions of

- Water (P & CP) Act 1974 [section 25] and
- Air (P & CP) Act, 1981 [section 21]

Different types of consent are Consent to Establish, Consent to Operate and Renewal of Consent to Operate.

#### **Consent to Establish:**

- All the industries and activities needing consent must obtain consent to establish before actual commencement of the works for establishing the industry/activity.

#### **Consent to Operate:**

- This consent needs to be taken before actual commencement of production including trial production. This consent is valid for certain duration.

#### **Renewal of Consent to Operate:**

- The consent to operate needs to be renewed after certain period.

Consent to Establish (CTE) US 25 /26 of the Water (P&C) Act, 1974 & US 21 Air (P&C) Act, 1981

It has been observed that PCB of most of the states specially coal mining belt-Orissa, WB, MP, Chattisgarh, Maharashtra, Jharkhand put almost all the conditions in the CTO conditions. Especially OPCB & MCB are particularly putting all the condition stipulated in EC into the Consent To Operate (CTO) conditions.

#### **7.0 Suggestion:**

Mine management of Coal Company requires paying attention on redundant conditions at the time or after the

issuance of environment clearance. As these conditions pose difficulty and put project proponent of Coal Company in problem while making compliance to the stipulated conditions of Environment clearance. On an average 3-4, conditions were found redundant and repetitive in nature in almost all the instrument issued for Environmental Clearance. The user agency / project proponent of the coal company needs to pay attention on the issues and must try to get it rectified. The suggestion are the authors' interpretation and not necessarily of the organization to which they belong.

#### **7.1 Conclusion**

Sectoral wise release of standard environmental conditions by MoEFCC vide OM No. F. No. 22-34/2018-IA. III dtd, 9.8.18, 9.11.18 and 4.1.19 for different sector including opencast coal mine, underground coal mine and coal washeries has given a tool to Project Proponent (PP) of Coal Company (CC) for smooth compliance of the EC conditions. A well-documented Environmental Management System in the form of Policy / Manual acts will act as an effective tool in implementing and improving various environmental programmes, so that the resources are optimally utilized to address environmental concerns through the allocation of resources and assignment of responsibilities.

This research paper is based on the analysis of six different sets of environmental clearance conditions for six mining complexes located in two coalfields namely North Karnpura Coalfield and Jharia Coalfield situated in Jharkhand state. Altogether 399 conditions relating to 268 of general and 131 of specific in nature imposed by MoEFCC while granting environmental clearance to particular project. The result of the f-n-p analysis reveals that 61% of the

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### 8.0 Acknowledgements

The authors would like to acknowledge the coal mines officials of coal mining companies for their help to complete this study. We would also like to thank all for extending online and offline support for achieving the objective of this study. The views presented by authors are solely their own interpretation and not necessarily of the organization to which they belong.

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# Cost Management For Organisational Efficiency

Professor T.P. Maitin\*

Financial discipline is the foundation of organisation development. It is a process of an effective utilization of resources in order to minimise the cost of production and operation. This, however, expects optimum efficiency in almost every branch of action. Again, profit is a composite result of efficiency, economy and effectiveness of resources as well as the level of participation or contribution made by the executives. Thus, we will discuss the contribution of costing to efficiency of management in order to attain economy of expenditure, proficiency of productivity and promotion of profitability.

## Resource Utilisation

Adequacy of funds is an essential need for successful management. Almost every expenditure centre is faced with the problem of scarcity of resources. This demands minimum application of resources, but with a constant goal of optimum returns. Application or utilisation of funds is often supported by massive investments which too involve a cost of market borrowing. Shareholders subscribe to corporate capital, supply the required funds to the business and anticipate a favourable dividend as well as a substantial appreciation in the realisable value of their securities. In the absence of an efficient management of business, however, a smooth flow of profits is rather difficult, which eventually disappoints the shareholders of the company and brings down the market price of its shares. This further affects the goodwill or the long-run growth plans of the business. It is

only a productive utilisation of money, men and materials, therefore, which may promote operational efficiency and business profits to the unit.

Finance is associated with yet another characteristic. It is full of risk and uncertainty. Moreover, any plan or project involves at least three basic conditions:

1. Safety of funds employed in the operation
2. Liquidity of resources used in the outlay
3. Profitability of total investments sufficient enough to satisfy the market conditions

These three factors govern the financial image of an organisation which may enable it to obtain the required market support in future, whenever it needs additional funds to finance its expansion or development. All this demonstrates how our participation and devotion are important contributories to a successful business operation, as also the corporate ability to market competitiveness; particularly in the area of productivity proficiency and profit efficiency.

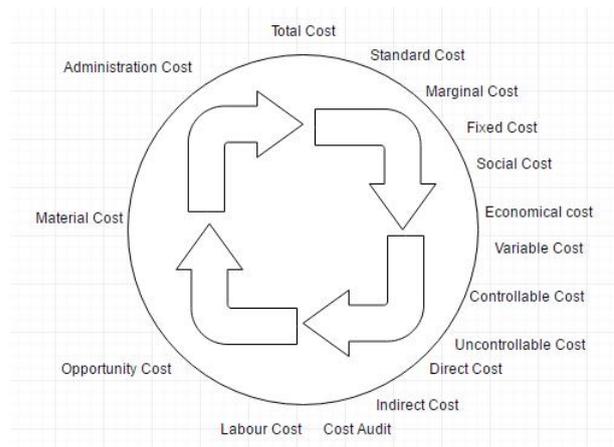
## Behavioural Cycle

All commercial organisations have a constant aim of earning an increasing amount of profits. Profits, however, are regulated by the cost behaviour. The total cost is a composition of material, labour and administration expenses. It is further divided into fixed cost and variable cost. It also identifies as controllable cost and

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uncontrollable cost. This means that in order to discipline the cost behaviour of a firm, substantial efforts are required to minimise expenses over materials, labour and administration. It is this effort only which can cut cost and boost profit, because higher the cost, the lower the profit and vice versa.

This analysis can be demonstrated through the following figure of cost cycle–



Cost is a combination concept. It is a component consisting of different elements. Cost involves cost of production and distribution of goods and services. Cost effectiveness, therefore, expects minimisation of resources used and maximisation of returns earned. In the life of an organisation, this is almost a continuous process of cost consciousness. For the financial executives, entrusted with the responsibility of output management, this is often recognized as an essential quality of cost ethics. It is a positive attitude of mind and an active attempt to ensure cost cutting and cost savings at almost every stage of operation. It is mainly a process of an alert observation and participative association which may bring down the level of cost and thereby improve the size of profits. It needs a systematic approach and an organised effort because even a slight negligence may cause heavy losses.

## Development Strategy

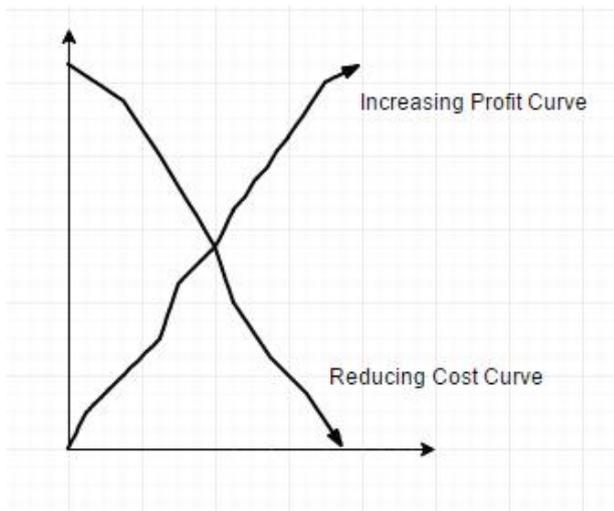
In organisational operations, possibilities of an unexpected rise in expenses are more common than sudden increase in earnings or profits. A proper strategy of cost reduction, therefore, is: (a) to apply best skills of cost management, that is, (i) plan well the size of funds being used and ensure their productive utilisation, (ii) control any wastage of resources or misuse of money, (iii) check misappropriations, manipulations or embezzlements, (iv) protect the established values of integrity and honesty supported by the organisation, (v) extend the best loyalty to the goals of financial management which may ultimately help improvements in the level of profit, and (b) Work for cost reduction, but not allow any decline in the quality of output of final goods and services.

An effective management of cost, therefore, is a necessity to organisation development; it is also a constant challenge. The right approach may be:

- Identification of cost points with higher risks and hazards
- Evaluation of flexibility competence to implement a favourable control over such points
- Application of suitable techniques to stabilise costs, preferably to bring them down through a close observation over constant, declining or increasing trends of expenditure in identified points of operation

This is a method of cost awareness, duly supported by an efficient execution of the guiding goals and values to profitability. Again, it is this form of cost efficiency which also enhances the competitive advantage of the company. Cost

stability is rather difficult to gain in any organisation. There may be unexpected and unpredictable trends affecting the cost movements. If it is a favourable trend, a reducing cost curve may bring in an increasing profit curve. This is, of course, an ideal condition for the business. The entire management mechanism has a continuous responsibility of maintaining favourable cost trends so as to generate additional or increasing revenue which benefits the shareholders, workers, society and the economy. The following figure demonstrates the interaction of cost and profit curves:



### **Recent Thoughts**

Some recent thoughts on cost reduction techniques serve as the guiding principles of profit maximisation. Such thoughts may be identified as follows:

- Cost cutting is no longer the solution to sustainable profitability; the key to success is finding creative ways to prevent cost (that is developing effective methods of cost prevention)
- Look for, find and remove unwarranted expenses from a business to increase profits without having a negative impact on product quality. Engage in periodic cost reduction drives in order

to make the operations more efficient and to boost profits

- Conduct some innovations in the way of working in a new style, so that the excess costs of operation and production could be eliminated. This includes specific efforts to reduce costs by improving methods, work arrangements and products. Cost reduction programmes need the support of research and development activity
- Once a new technique of cost reduction is introduced, it may offer competitive advantages for a long period
- The major aim of cost reduction is to see whether there is any possibility of bringing about a saving in the costs incurred on materials, labour, overheads etc.

The current emphasis on industrialisation for economic development, therefore, incorporates a constant goal of cost reduction in various operations which benefits the different segments of the society.

In order to gain cost reductions:

- Obtain more output from the same input and facilities
- Use a lesser quality of inputs to get the same output
- Simplify the methods of distribution; minimise the chain of intermediaries engaged in supply network
- Supervise effectively the location and layout of plant equipment, warehouse and other resources

Cost reductions, therefore, need an organised approach to the task, because

it has the dual advantage of economy of output and enhancement of profits.

### **Useful Techniques**

Some useful techniques of cost reduction which may be applied are as follows:

- Produce the required items at planned quality and quantity, at the precise time they are needed, with a view to reduce investment in inventories
- Target the cost, price and profit so that the product commands profit even at the market driven price
- Identify and eliminate non-value added activities and costs
- Develop life-cycle costing estimates and ensure that the profits earned will fully cover the costs incurred
- Apply a continual and gradual improvement in production process through small activities, rather than large innovations or investment technologies
- Improve the key business process through simplification, cost minimisation, quality enhancement and customer satisfaction
- Adopt value chain system to achieve higher customer satisfaction with a more effective cost management process
- Compare the existing methods and performance levels with those of other organisations or other subsidiaries within the same organisation
- Introduce management or performance audits in order to identify waste and efficiency and to recommend a corrective action

The exact methods or strategies of cost reduction, however, vary with the size and nature of the organisation. Only such tools or techniques, therefore, should be applied which match with the needs and expectations of the production unit.

### **Market Forces**

Every organisation has its own behavioural trends in cost components. Accordingly, it often fluctuates, not only due to the changes in market conditions, but also owing to the policy decisions of the management. The basic approach, however, remains to minimise the aggregate expenses over the final output of goods and services. For, it is this form of cost control which can generate additional revenue to the unit which eventually favours payment for salary, wages, dividend, bonus or even corporate social welfare.

This means a continuous management responsibility of:

- Keeping a constant watch over the cost movements
- Following a strict level of cost etiquette
- Enforcing an all-round cost discipline
- Applying the best possible professional skill to watch the cost curve
- Preventing an unplanned or unexpected fluctuation in cost transactions
- Maintaining an efficient system of cost management techniques for the overall effectiveness and economy of the organisation

The whole approach should cover both aspects of cost – direct cost and indirect cost, i.e. prime cost and overheads. It

may be easier to reduce variable cost, but rather difficult to control fixed cost. The former affects the cost behaviour in the short run, the latter in the long run.

There is yet another aspect of this analysis. While the management may exercise its own skill to reduce cost internally, there are much stronger external forces which continuously cause a rise or fall in the supply network; the cost of goods and services obtained from external sources are often beyond our control. Under such situations, the management may find itself helpless in reducing costs despite its best efforts. This is the real challenge of cost management in coordination of internal and external forces or in control of the cost pattern in the company. The cost structure in a production-based operation is rather complex. It needs sufficient expertise to identify the weaker points of cost creation and to apply appropriate methods of their reduction. In this process of supply of men, materials and money from the open market in order to maintain our production schedules, the most significant aspect of attention is to safeguard against any possible dislocation or disturbance in the flow of procurements. In other words, any policy of cost reduction should not be such as to hamper the smoothness of production; do try to reduce costs, but do not cause any discontinuation in production or distribution.

Again, while a company has to rely upon the market system to obtain its supplies on a regular basis, it has to go back to the same market for selling its products profitably. Management, therefore, must follow a market-friendly relation both for its inflow and outflow of goods and services.

## **Investment Productivity**

Profit is the fundamental goal of any commercial operation. It is an essential motivation to business investments, an expected compensation to financial or trading risks and an incentive to efficiency of participation. Profit, therefore, governs the institutional goodwill of a firm, because it is also a reliable indicator of financial soundness and solvency (i.e. the risk bearing capacity) of the company.

Profit is dependent upon two significant forces: revenue and cost. In order to raise the level of profits, constant efforts are required to maximise revenue and minimise cost so as to obtain a favourable surplus. One has to determine the price and output level that returns the optimum profit. Obviously, profit maximisation is the most dominant goal of a business. This expects an efficient management of resources through an effective application of planning, control, coordination and direction of activities. In other words, it is only a productive utilisation of efforts which may give investor satisfaction. Profits are maximised when Marginal revenue is equal to Marginal Cost. This means a task of lowest operating expenses and a supporting ability to draw the best possible margin on sales. It is a significant and sensitive choice of both inputs and outputs so as to achieve the basic goal of maximum economic prosperity. The choice contains a series of business decisions which minimise risk and maximise returns.

## **Conclusion**

The major advantage of cost reduction for profit maximisation, therefore are as follows:

- Financial rewards proportional to

employment of funds, efforts to efficiency and acceptance of risks

- Retained confidence and trust of investors and creditors in the company
- Ability of self-financing of future business needs through retained earnings and improved equity status, both contributing to enhanced institutional value
- Better industrial relations through profit-sharing schemes of providing additional benefit to the employees
- Opportunities of further growth owing to competitive advantage of efficiency and goodwill (while growth indicates a quantitative change in the process of production, development makes a qualitative change in the style of operation)
- Possibilities of attracting the best professional talents operating in the market who may boost the performance standards of the company

To sum up, the combined efforts of cost reduction and profit maximisation are a necessity of modern management systems, rather than any option. Cost study, cost evaluation, cost control and cost reduction are the most critical aspects of corporate financial management. It is a continuous process of variance analysis too in order to ascertain whether cost movements are favourable or adverse in between the cost estimates and cost actuals, also keeping in view the standard costs of the industry. In essence, these are the basic instruments of profit management too which govern both the survival and growth of any production unit. Cost and profit, therefore, are the twin tools of business management which often move together, guided and governed by each other, but invariably with an inverse relationship. It is the protection of this sensitive relationship which is a constant challenge for the management of the organisation. This relationship has to be to the best advantage of the organisation.

# REQUIREMENTS OF ISO 14001 AND THEIR APPLICATION IN COAL MINING COMPANY

Sri Sanjeev Kumar\*

Mining companies impact their surroundings with varying degrees of severity, whether adverse or beneficial. Environmental impacts must be controlled, and significant environmental impacts are avoided or mitigated in direct relation to a company's ability to manage environmental aspects. According to ISO 14001, environmental aspects are those elements of a company's activities, products, and services that can interact with its surroundings. This is where ISO 14001 certification makes a difference, both in how effectively a company manages environmental aspects, and how others perceive their effectiveness.

## **Environmental impacts of mining companies**

A mining company's environment is defined by its immediate and global surroundings air, water, land, natural resources, flora, fauna, humans, and their interrelation. Its environmental management needs to extend to that same scope of responsibility.

For example, mining activities use significant amounts of energy for transporting coal, overburden (OB), employees, equipment, scraps, and wastes. They also need power for ventilation, drilling, conveying and transportation operations. Even domestic and administrative duties in offices and for onsite accommodations require energy and power.

Mine wastes such as rejects and rock debris are sources of contamination and

environmental impact. Mine effluents, runoffs, and airborne emissions are additional impacts on terrestrial and aquatic ecosystems. Miners themselves are targets for detriments to their health, such as smoke, toxic atmospheres, inhaled contaminants or irritants, and life-threatening illnesses like asbestosis and black lung disease.

According to ISO 14001, our organization's environmental performance is only as good as our ability to manage our environmental aspects. Measurable performance indicators for mining companies include energy and water consumption, wastes and waste streams, air and water quality, noise levels, first-aid and lost-time incidents, and number of reported environmental incidents.

We can measure how well we manage our environmental aspects by setting measurable goals and comparing our success and failure against our Environmental Policy, objectives, targets, customer expectations, and regulatory requirements.

The following **environmental concerns** should be considered by a mining project at the time of environmental review of its processes and assessment of their associated environmental aspects.

1. GLOBAL WARMING
2. OZONE LAYER DEPLETION
3. LOSS OF BIODIVERSITY
4. NUCLEAR CONTAMINATION

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5. DEPLETION OF NATURAL RESOURCES
6. TOXIC CHEMICALS
7. AIR POLLUTION
8. WATER POLLUTION
9. NOISE POLLUTION
10. QUALITY OF LIFE
11. DISPOSAL OF E- WASTES
12. LIGHT POLLUTION

**Implementation of ISO 14001 results in reduction in waste disposal and energy**

After implementation of Environmental Management System (EMS) in true spirit for a certain period, assessment should be done considering different parameters such as segregating wastes based on type, contamination, and best available treatment mechanism or disposal method with reduced costs and mitigated pollution emissions, in order to measure the environmental performance. During this assessment for ISO 14001 Environmental Management System (EMS) the measurable improvements in selected performance indicators need to be verified. For example, a conscious decision made to use energy more wisely resulted in removing and replacing inefficient light bulbs and other electronic gadgets, with more energy-saving designs. These energy conservation actions decreased energy consumption and overall energy costs, in line with the ISO 14001 Environmental Policy.

**Environmental responsibility is not only ethical, but necessary**

Unreported environmental insults and incidents are a threat to any company's success and increase its liability. Mining companies worldwide share a history of negligence and environmental degradation

by some, often with little or no transparency for investigation or public scrutiny. Being environmentally responsible is not only ethical, but necessary in sustaining any mining operation in today's and tomorrow's markets.

Measurable improvements in performance demonstrate commitment, competence, and capability in meeting environmental targets and environmental objectives. An ISO 14001 EMS (Environmental Management System) provides proven guidance and tools for improved environmental performance that contributes to economic gains and fosters accountability.

Demonstrating sound environmental performance is one of many values miners and mining enterprises get from an ISO 14001 EMS. It shows that we have a documented systematic process to control and influence our products and activities, which impact or can impact our immediate or global surroundings. An ISO 14001 EMS provides objective evidence that we are implementing an Environmental Policy available to stakeholders and based on specific objectives and improvement targets. A certified ISO 14001 system provides for periodic audits and management reviews of system performance, tracking of corrective actions, and a commitment to continual improvement.

**Benefits of ISO 14001 EMS certification**

There are important differences between uncertified EMS and those certified to ISO 14001 by an accredited body. Certification is performed by an independent registrar accredited for competence in an industry, such as mining, and requires third-party audit. Both of these provide public demonstration of our commitment to

being an environmental steward with a transparent and systematic approach to managing environmental performance. Adopting an uncertified environmental program, however, is an internal action without such a public demonstration, and therefore it becomes hard to convince and communicate to external stakeholders such as customers, clients, communities, or regulators.

Benefits that miners and mining enterprises have found from implementing a certified ISO 14001 EMS include:

- ISO 14001 registration gives market recognition, and stakeholder and regulatory appreciation
- Reduced environmental risk and liability, an advantage over competitors
- Cost savings through waste reduction, recycling, energy and water conservation
- Effective management practices to achieve and improve environmental performance
- Continual, progressive improvement to reap economic benefits
- Increased recognition of environmental issues for timely prevention
- Awareness of individual roles and environmental protection responsibilities
- Improved personnel awareness of sharing environmental management responsibility
- Lower insurance costs; lesser fines or fines avoided altogether.

### **Tips to Build a Positive Environmental Culture in a Company**

Any organization which has an ISO 14001:2015 EMS (Environmental

Management System) can testify that successfully establishing and maintaining the system can be significantly easier if the organization can develop a culture of environmental awareness and good practice. Traditionally, changing culture in a business can be a long and difficult task, so, if this is to be achieved, what tips can be taken on board to make this happen as smoothly and quickly as possible?

### **Building our culture – how to begin**

Changing a company's culture, like any major task or project, is a gradual process that needs planning and perseverance. The good news is that there are several compelling reasons for our workforce to open themselves to the benefit of ISO 14001:2015 certification, and move to a culture that fosters good environmental awareness, improvement and continual improvement of the EMS. Let us look at some of the things that the top management team can do to help establish and maintain this culture:

- 1) Make everyone aware of the financial benefits:** From money saved by eliminating waste to enabling our mine to compete for contracts that only an ISO 14001:2015 certified organization qualifies for, the financial benefits for the certified organizations can be great. The employees must be made aware of the financial benefits that a successful EMS can bring. Every employee wants to be part of an initiative that can help guarantee future growth and job security within an organization that does not have to pay financial penalties.
- 2) Engage our leaders to drive culture change:** The leaders of the company should play a prominent role in the promotion of the EMS, and engage with employees in improvement

forums or group meetings. With top management as the key to communicating results and initiatives to the workforce, the importance of environmental performance will grow in the workforce's consciousness. Many organizations reflect the values of its leaders directly, so we should encourage our top management to promote the importance of environmental performance.

- 3) **Promote a culture where training, awareness and competence is key:** As obvious as it may seem, the more training and awareness is promoted, the easier it would be to establish better culture in the company. Training and increased competence not only improves performance, but also improves employee self-esteem and morale. These are all key elements of changing a company's culture over time.
- 4) **Communicate constantly, accurately and clearly:** Communication is key to culture change. Sometimes a workforce needs to hear the same message repeatedly before that message becomes "business as usual." Sometimes, they even need to hear the same information in a different format. Ensure that communication happens constantly. Again, the importance of environmental matters will become ingrained in the daily lives of the workforce, and all the tasks we undertake.
- 5) **Promote personal responsibility:** Whether by means of monthly forums, company communications or even competitions, why not find different ways to promote personal responsibility within our organization? Every employee can make a difference,

whether in their use of water and electricity, decisions about which car to buy or how frequently they can cycle or use public transportation. Even ideas within the workplace to reduce waste and increase efficiency can help a business. Consider rewarding employees who promote good practice. Doing so rewards good performance and promotes a culture of personal responsibility within the organization and both elements will filter through to improve the company's environmental performance.

### **Why is a positive environmental culture important?**

It is now generally accepted that mankind is consuming some of the earth's natural resources at an increased rate. That means that, in the next 20-30 years, we will see the first major shortages or end of supply in some or all 50 precious metals, such as indium which is used in the computer or smartphone we are using. Promoting a culture of environmental awareness and making informed and sustainable decisions within the activities of our EMS is just one part of addressing mankind's consumption rates, but it is a sensible and achievable start. Every organization can achieve this, and every employee within these organizations can be made aware of their part within that structure. If we start changing our company culture today, our EMS results will see the benefit almost immediately. In the longer term, we will be helping to preserve the planet's resources for our children.

### **ISO 14001 for sustainable and competitive mining**

It is a competitive advantage for any mining company to pursue and achieve

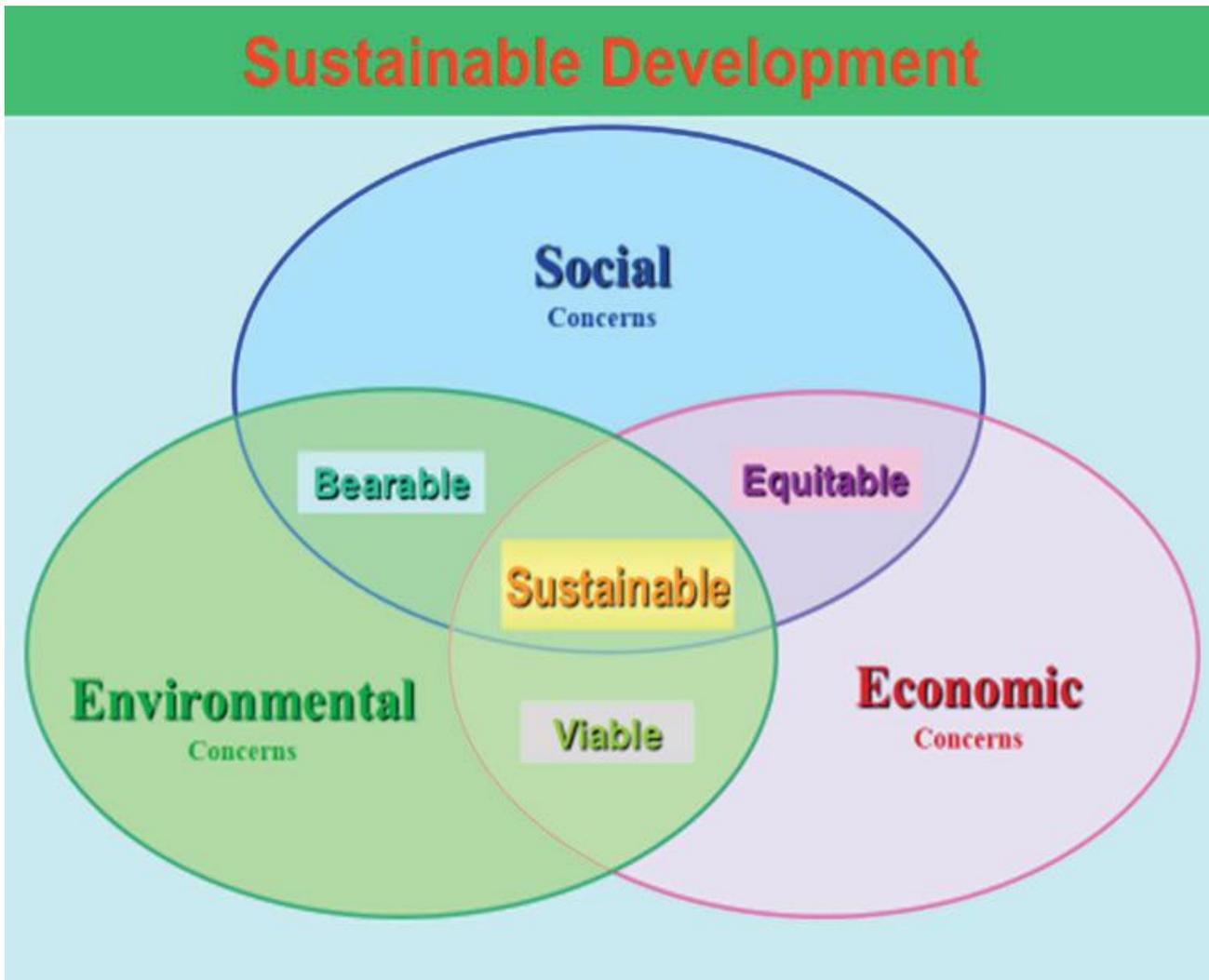
ISO 14001 EMS certification. Popular and globally accepted, this voluntary, consensus-based EMS provides a tool belt of practical performance management measures for use at every level of our organization.

Effective environmental management means an educated and purposeful awareness of threats to performance, problem areas, and weaknesses, in order to avoid or encourage/discourage a particular decision or action. A certified

ISO 14001 EMS is a preferred framework for sustainable mining in a healthy environment.

**No Business or Development can be Sustainable, if it does-not or can-not simultaneously address**

- Economic concerns / development
- Social concerns / development
- Environmental concerns / protection



Concept of sustainability

All these 3 are interdependent and mutually reinforcing pillars of *sustainability*

Integrating an environmental management system (EMS) into mining and related operations, describes how

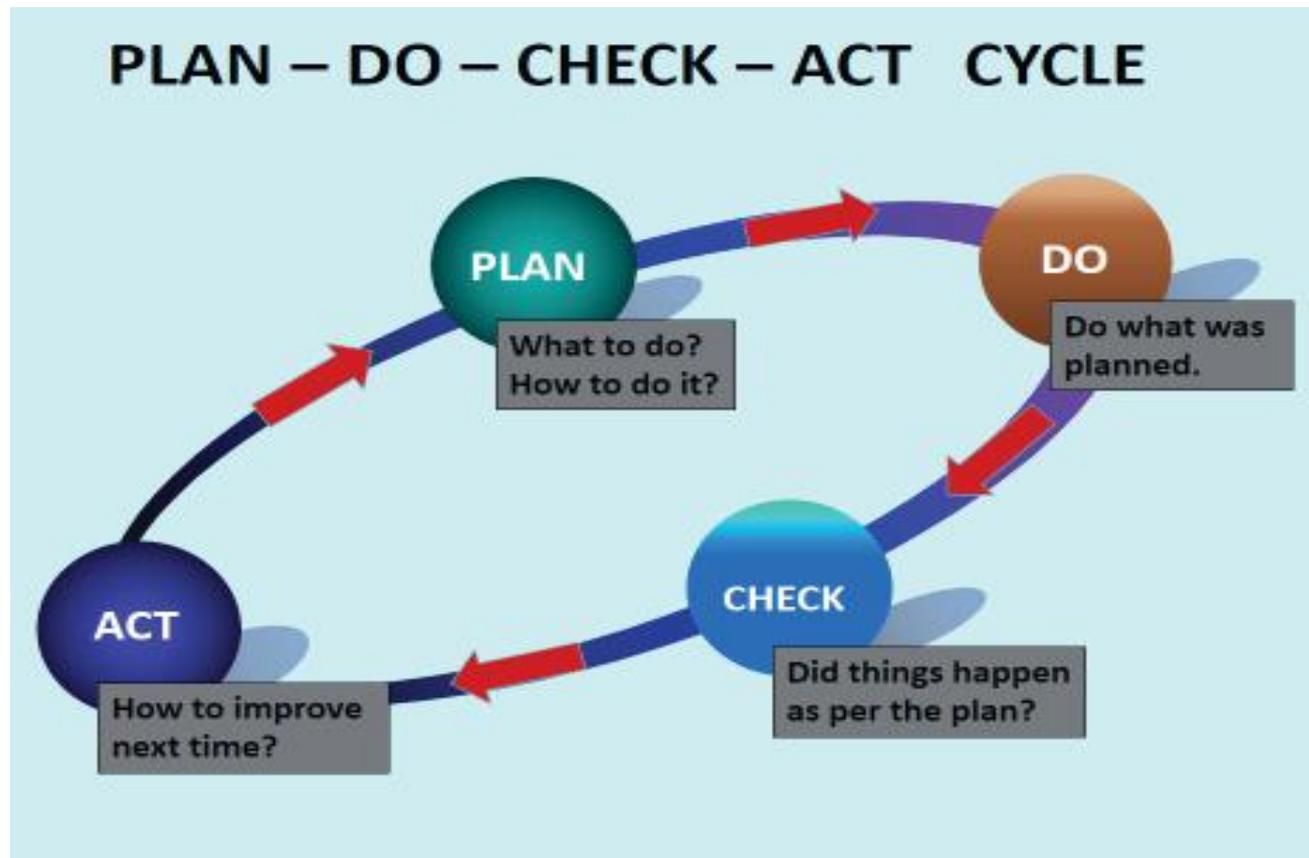
it can contribute to cleaner production in the industry, and provides guidelines to facilitate implementation. An

EMS, which is the component of the overall management system that includes organizational procedures, environmental responsibilities, and processes, can help a mining company comply with environmental regulations, identify technical and economic benefits, and ensure that corporate environmental policies are adopted and followed. To date, a number of multinational (mining) corporations—namely, the companies with economical and technological flexibility—have implemented comprehensive EMSs at sites. The key in such cases being the formation of working partnerships with administrative bodies and international organizations. A number of other mine sites worldwide, however, despite having important environmental management practices such as audits and policies in place, have received insufficient assistance and/or simply lack

the requisite resources to integrate an effective EMS into operations.

A series of guidelines for mining companies keen on adopting comprehensive EMSs at sites, arguments to facilitate widespread EMS implementation throughout the industry and expanded inputs are needed from governments, international environmental organizations, educational facilities and the companies themselves. More specifically, regional governments must provide assistance to the more resource-deficient operations. Local universities must provide the necessary EMS educational assistance to local miners and finance environmental technology demonstration projects. International organizations must help disseminate valuable EMS information to mine managers and technical staff.

### **PDCA APPROACH OF EMS:**



## **The process of EMS Certification:**

EMS certification is ISO 14001, which is awarded by ISO-accredited certification bodies. The main advantage of the standard is that it is homogenous internationally, and that globally, individuals are familiar with its process of certification. A certified EMS is one that would pass certification standards measured by an independent body. Simply put, an ISO 14001 certified mining company would have a similar EMS to that of a ISO 14001 mining company in any other country.

Certification can be expensive, however, and the requirements for conformity can be beyond the budgetary means of a small company. In fact, given the costs of registration, combined with the costs of consultancy expertise, it is unrealistic to assume that any small operation—in this case, a mine—would be able to get its EMS certificate without outside assistance. It is important to clarify that an EMS need not be certified to be effective, and that many mining companies worldwide have opted only to use the ISO standards as general guidelines for developing EMSs at sites. In short, a company does not require certification to have an effective EMS in place, but the management should follow ISO 14001, when designing and implementing EMSs because then it targets the prevention of negative environmental impacts, emphasizes environmentally friendly product design, encourages solid documentation, and is overall, a proactive preventative strategy that mandates companies to set objectives and targets incorporating strategies for continual environmental improvements. ISO 14001 is merely a framework,

and an organization must have the pertinent elements in place to ensure that it effectively functions. As already noted, occasionally, a company may be unable to invest the capital needed for ISO 14001 certification, in which case it commonly follows the ISO principles when developing and implementing an EMS. An issue more specific to mining, however, is the fact that a number of companies have elected not to adopt an ISO 14001 certified EMS because it has limited utility in marketing and regulatory compliance strategy. The ISO standards are increasingly proving to be an integral marketing tool in the manufacturing sector because of escalated demands for green consumerism. In fact, it could be effectively argued that nowadays, the backbone of green consumerism is an ISO certified EMS.

Benefits of implementing a mining EMS are immense given the wide range of environmental complications that can otherwise result from mining and related processes. Successful integration of comprehensive EMSs into operations could serve to significantly benefit the mining sector by better enabling companies to address environmental concerns through proper allocation of resources, assignment of responsibilities and ongoing evaluation of practices, procedures and processes.

### **Basic Approach for implementation of ISO 14001 in a mining project:**

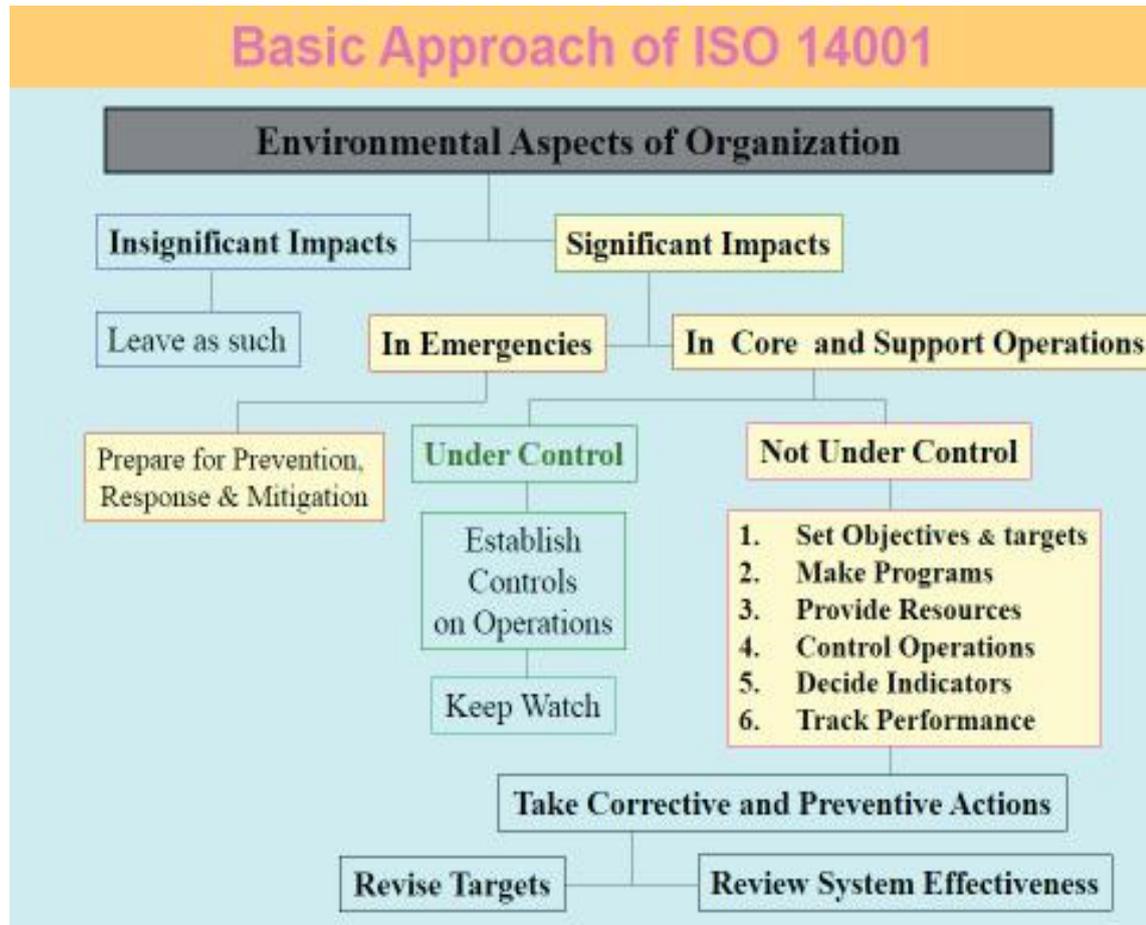
ISO 14001 recognizes that every organization has,

- Some products / services,
- Some activities / operations

Some of their elements can interact

with environment and all such elements are Environmental Aspects of that organization

EMS is all about identifying and managing these Environmental Aspects



### Road Map for implementation of ISO 14001 in a mining project:

- ❖ IDENTIFY ALL ACTIVITIES/PRODUCTS AND THEIR ASSOCIATED ENVIRONMENTAL ASPECTS
- ❖ DETERMINE ALL POSSIBLE IMPACTS OF ALL ENVIRONMENTAL ASPECTS
- ❖ DETERMINE CRITERIA, AND IDENTIFY SIGNIFICANT ENVIRONMENTAL ASPECTS
- ❖ SET OBJECTIVES, TARGETS, PROGRAMS FOR SIGNIFICANT ENVIRONMENTAL ASPECTS
- ❖ ESTABLISH PROCEDURES TO CONTROL RELATED ACTIVITIES
- ❖ CHECK COMPLIANCE / EFFECTIVENESS OF IMPLEMENTATION
- ❖ STRIVE FOR IMPROVEMENT



