# Attitudes of Mining Engineers in Indian Coal Mining Industry towards Corporate Social Responsibility: An Evaluation

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**Abstract**— Most of the business organizations all over the world practice corporate social responsibility (CSR). In India, this is mandatory to integrate CSR with core business operations of the company in order to achieve sustainable development goals. For effective integration and implmentation of objective-based CSR programs, this is essential that managers of the industry bear positive attitudes towards CSR, so that decisions taken by them concentrate to the goals. In Indian coal mining industry, it is the mining engineers who normally manage operations of the industry, and are responsible for taking decisions. This explorative research aims to evaluate the degree of attitudes of mining engineers towards CSR. Responses of 362 practicing mining engineers in coal mining industry against a well-constructed questionnaire were obtained, with an aim to develop more awareness towards the subject. Analysis of the data reflected that a large proportion of engineers are well aware with the concept of CSR and its implementation and bear significantly positive cognitive component as well as affective component of attitudes, but require further improvement in behavioral component of attitudes which is very much essential for deciding suitable CSR programs and their effective implementation. The highly positive attitudes of engineers at junior level, as observed in the survey, indicated a bright future for integration of CSR in core operations of the industry.

**Index Terms**— Attitudes, Awareness, Coal mining industry, Corporate social responsibility, Decision making, Mining engineers, Sustainable development



## 1 INTRODUCTION

THE faster rate of exploitation of the natural resources than they are being created or replaced have put forward a frightening challenge before the world whether the globe will sustain in future. A series of efforts have been initiated in order to ensure sustainable development especially after publication of United Nations World Commission on Environment and Development (WCED) Report [1]. The Report defined sustainable development as 'the development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. The basic concepts of sustainable development are (i) the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given, and (ii) the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs. Sustainable development implies a process of change in which the utilization of resources, the direction of investments, the orientation of technological innovation and exchange, and institutional change, reflect both future and present needs. Emphasis has continuosly been put upon the need for changes in attitudes to sustainable development, as depicted through policy documents of UN and UNESCO as well as global curriculums and numerous global reports.

Business organizations all over the globe share their responsibility towards sustainable development by way of integrating CSR and sustainability measures in their core business operations.

The present concept of CSR started growing in last century as a management concept to manage businesses for bringing about an overall positive impact on the communities, cultures, societies and environments in which they operate. CSR is generally understood as being the way through which a company achieves a balance of economic, environmental and social imperatives, while at the same time addressing the expectations of shareholders and stakeholders. The term CSR in academic literatures dates back 1930s e.g. [2], [3]. By late 1990s, the concept was fully recognized by the academicians, politicians, institutions and researchers across the globe that started supporting it. Corporate Social Responsibility (CSR) has attracted a great deal of attention over the past decade [4]. A large number of companies appear increasingly engaged in a serious effort to integrate CSR with core business operations, but many companies traditionally take up their CSR initiatives without explicitly communicating them in the community or even inside the company. Managers in companies usually possess positions with access to information and channels of influence in and out organizations; they influence the expectations of all stakeholders. The role of manager is very important in deciding suitable CSR programs, their implementation and reporting. But traditional managers often escape from their responsibility because people do seek consistency among their attitudes and between their attitudes and their behavior [5] and they resist adopting new concepts. Managers of businesses are being called to action; and not just to pay lip service

to the idea of good corporate citizenship by doing a few social works [6]. National or international business can be no more ethical than the persons who run the firms [7].

### 1.1 Statement of the problem and the objectives

Extractive industries exploit most the world's natural capital (the earth, the environment, the living entity) for their business purposes. As such, they are more accountable to share the benefits among all stakeholders and to mitigate the negative effects arising out of their businesses. Mining industries raise a lot of social and environmental problems like loss of land, soil degradation, emission of noxious gases, dust, noise and water pollution, and affect local biodiversities. In order to mitigate the negative impacts resulting from its activities and to play its part of achieving sustainable development goals, the industry practices CSR programs. Coal mining industry faces greater challenges on account of environment and society because the industry is increasing production year by year to meet energy need of the nation. Abundant cheap and highly polluting energy supplies, while providing essential inputs for economic growth in the short term, result in unsustainable local, regional, and global environmental and health effects over the medium and long term, as seen throughout the industrial world and now increasingly in China and India [8]. The Indian coal mining industry has been making significant expenditures and putting efforts on account of CSR activities but the outcome towards achieving sustainable development goals is often criticized. According to Sustainable development to a certain degree will be influenced by how future leaders and managers respond to the need to adopt CSR practices [9].

In organizational structure of Indian coal mining industry, it is the mining engineers who are normally the managers of collieries; they make decisions right from conceptualization, planning, designing, execution and evaluation of all operations in the industry. Their right decisions into the subject result into effective and efficient completion of tasks. The direction and quality of decisions into the subject depends on accuracy of awareness and attitudes towards the subject. The degree of awareness and attitudes of mining engineers towards CSR in Indian coal mining industry have never been evaluated. Here lies the problem of the instant research. The research has been conducted with following objectives: (i) to evaluate the awareness level of mining engineers towards CSR, (ii) to evaluate the attitudes of mining engineers towards CSR, and (iii) to indentify the improvement area and provide a feed back into the matter.

The evaluation done in the research is expected to enhance the positive attitudes towards CSR in the industry and to make the stakeholders understand the changes required for achieving the objectives of CSR.

### 1.2 Constructs

Outcome construct of interest in the research is evaluation of awareness and attitudes of mining engineers towards CSR. For the purpose of designing a meaningful construct, the CSR subject, independent variable of the construct, was broken down into a number of aspects like definition, objective, activities, implementation procedure, outcome, reporting, international expectations, statutory provisions in the country, and grouped in three frames for the purpose of evaluating the dependent variable, the awareness and attitudes towards meaning of CSR and its objective, prevalent CSR practices, implementation procedure, and its reporting.

Attitude is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related [10]. It is 'an evaluative disposition toward some object based upon cognitions, affective reactions, behavioral intentions, and past behaviors… that can influence cognitions, affective responses, and future intentions and behaviors' [11]. Attitudes are complex. In order to understand the complexity and potential relationship between attitudes and behavior, recent researchers view attitudes through its three components viz. cognitive component (evaluation), affective component (feeling), and behavioral component (action). The cognitive component of an attitude is conceptualized as a person's factual knowledge of the situation, object, or person, including oneself. In other words, the cognitive component refers to how much a person knows about a topic. The affective component of attitude is said to consist of a person's evaluation of, liking of, or emotional response to some situation, object, or person. Affective responses reflect one's attitude with sensations of pleasure, sadness, or other levels of physical arousal. The behavioral component of an attitude involves the person's overt (open) behavior directed toward a situation, object, or person. Finally, the behavioral intention component involves the person's plans to perform in a certain way, even if sometimes these plans are never acted upon. The three components are not isolated but are interrelated and produce an organizing framework or mental representation of the attitude construct.

Managers' attitudes of social responsibilities in businesses have been investigated through researches in recent past [12]. Since attitudes are defined as latent, the researchers identify some action that would seem to be representative of the attitude in question so that this behavior might be measured as an index of the attitude. There are several generally recognized procedures used to determine quantitatively an individual's, or group attitudes toward some target. The manual 'How to measure attitudes' of Henerson, Morris, and Fitz-Gibbon [13] was followed for the purpose of the instant work.

Situational stimuli or events in the environment directly influence behavior and the formation of attitudes; and the internal events that form attitudes are the result of observable actions. Out of the three responsible parameters for shaping the awareness and attitudes viz. the mining engineers, the in-

ternal and external environment of coal mining industry and the CSR, the two parameters viz. the mining engineers and the coal mining industry were assumed constant during the study period. For evaluation of the dependent variable i.e. the awareness and attitudes, the target (CSR) was also considered constant (independent variable) at particular period of the survey. The degree of awareness and attitudes of mining engineers towards CSR, the belief, assumption, knowledge, interest, experience and expectation of mining engineers towards CSR were evaluated. This provided a composite picture of awareness and attitudes towards objectives and expectations of the target CSR in the social setting and working of the situation of the industry.

**1.3 Literature citation and review**

All over the world in past, governing institutions, business organizations and even individuals had been sharing their profits among stakeholders, and helping the poor and disadvantaged through various systems viz. jakaat, daan, dharmarth, dashansha etc., and this has profoundly been cited in various ancient literatures as ethical responsibility. In modern era of CSR research, in the initial stages it was often referred to as social responsibility and the literatures were primarily at the institutional level [14] with the discourse being around the role of the firm in society [15],[16], [17]. Carroll defined CSR as the economic, legal, ethical, and discretionary expectations that society has of organizations at a given point in time [18]. Over thirty-five definitions of CSR have been proposed [19], [20] by 2008, even then the CSR related researches, debates and discussions in many contexts still continue. The subject is vastly narrated and discussed internationally by now.

The importance attached to CSR may differ in each country [21]; the concept of CSR adopted in one country may perhaps be of little or no significance in another. Matten and Moon studied why forms of CSR differ among countries by comparing United States with Europe [20] and identified differences like the power of the state, governments' engagement in economic and social activity, financial sources and education and labour systems, environment legislations. Issues such as poverty, inability to service and repay international debt, illiteracy, HIV/AIDS, the absence of clean running water and electricity, fraud, bribery and corruption are typical of the underdeveloped world whilst other issues such as global warming, terrorism, money laundering, corporate and individual philanthropy, $CO_2$ emissions reduction might be issues that affect all nations but are publicized by the more industrialized ones [21]. As our study is related to evaluation of attitudes in Indian coal mining industry, the expectations of CSR from coal mining industry is narrated below.

Indian coal mining industry is mostly (over 90%) government-owned public sector enterprise (PSE) and so bears larger responsibility, because "being part of the State, has a moral responsibility to play an active role in discharging the social obligations endowed on a welfare State, subject to the financial health of the enterprise as per the Findings of Committee of Public Undertakings 1992, Government of India. The Department of Public Enterprises (DPE), Government of India defined CSR that this is 'a philosophy wherein organizations serve the interest of society by taking responsibility for the impact of their activities on customers, employees, shareholders, communities and the environment in all aspects of their operations' **(**DPE Guidelines 2010). The Government became more specific in 2013 and asked the industry to 'formulate its policies with a balanced emphasis on all aspects of CSR and Sustainability – equally with regard to its internal operations, activities and processes, as well as in its response to externalities.' Further, the industry has to act in a socially responsible manner at all times; even the normal business activities to be conducted in a manner that is beneficial to both, business and society' (DPE Guidelines 2013). A section 135, exclusively for CSR was brought in Companies' Act in 2013. The Act was supplemented with Companies (CSR) Rules in April 2014 and fresh DPE Guidelines, 2014. Through these legislations, the Government of India made it compulsory for companies to participate in the process of development of the society through CSR, and became the first country to mandate spend on CSR activities through statutory provisions. These legislations provide complete framework for CSR in organizations like compulsory expenditure of 2% of net profit in CSR activities, composition of CSR Committee, framing of CSR policy, monitoring of CSR, selection of activities under CSR, preference to local area, execution of activities and reporting etc. A list of activities which may be undertaken by the companies in their CSR program has been provided in Schedule-VII of Companies' Act 2013. Vide DPE Guidelines, 2014, the Government stated that 'CSR and sustainable development are treated as complementary' and directed the industry 'not to overlook the larger objective of sustainable development in the conduct of business and in pursuit of CSR agenda'. And stressed that the industry shall 'not lose sight of its social and environmental responsibility and commitment to sustainable development even in activities undertaken in pursuance of their normal course of business', and 'the philosophy and spirit of CSR and sustainability should be understood and imbibed by the employees at all levels and get embedded in the core values of the company', and 'preference should be given to the 'local area' in selecting the location of their CSR activities'. The CSR activities which are envisaged in the Act (Schedule VII) and in the CSR Rules can be supplemented with sustainability initiatives as both aim at achieving sustainable development goals. The spirit of CSR lies in integration of sustainable measures with all operations of the industry for economic, environmental and social development. The legislation requires under CSR that 'business activities to be conducted in a manner that is beneficial to both, business and society'.

In response to the international expectations and the legis-

lations, the coal mining industry in India put CSR activities in practice for contributing to the well-being of the environment, the communities and the society it affects. As per the Report of Committee on Public Undertakings (2014-15), Ministry of Coal, Government of India, budget allocation against CSR activities and actual expenditure of Coal India Limited in 2013-14 was Rs.4,743.6 million and Rs. 4,093.7 million respectively and budget allocation for the year 2014-15 was Rs.4,716.5 million. The CSR activities undertaken by the industry consisted of mainly welfare activities including education, health, and infrastructure and skill development. The Budget for CSR expenditure of Coal India Limited for the year 2014-15 was Rs. 4716.5 million out of which 50% had been earmarked for Sanitation Project under 'Swachh Vidyalaya Campaign' of India. The Government has notified recently those contributions to the three funds viz. Prime Minister's Relief Fund, Swachh Bharat Kosh and Clean Ganga Fund will be recognised as CSR activity.

### 1.4 Statement of Hypothesis

The only hypothesis of the research is as below

$H_0$: Mining engineers in Indian coal mining industry do not bear positive attitudes towards CSR.

$H_1$: Mining engineers in Indian coal mining industry bear positive attitudes towards CSR.

## 2 Materials and Methods

### 2.1 Sample

Eastern Coalfields Limited (ECL) has been taken as representative cluster sample for survey amonst eight subsidiary companies of Coal India Limited. Coal India Limited is an organised state owned coal mining corporate of India. It is the single largest coal mining company in the world and produces over 80% of India's overall coal production. It has seven wholly owned coal producing subsidiary companies, and ECL is one of them. ECL is centrally located in Indian coal mining industry and practices almost all types of engineering operations and technologies as in use in India; social conditions are also similar as in other companies and methods of working are also equivalent. As all the issues related to the subject are all similar in various companies of the nation, the sample was approximately fair to prove its external validity. The population of interest for this structured conceptualization and implementation evaluation is mining engineers who are holding the post of manager or above manager of collieries or will become manager in future. Efforts were made to encourage all mining engineers in ECL to become involved in the evaluation, to know in general the degree of their attitude towards CSR. The sampling frame and contact details of mining engineers were obtained from the company's website. Out of the total population of mining engineers in the company, 82% could be contacted for survey. Because engineers are placed in 14 different areas of the company scattered in different states of the nation and for time limiting factor for the survey, the remaining 18% engineers could not be involved.

### 2.2 Measures

Well-established scale development procedure as narrated by Netemeyer [22] was followed for generation of a comprehensive item pool. Items for the measures were initially developed using a deductive approach for generating items based on the literature and guiding definition of CSR and implementation procedure as per Indian law and international norms presented earlier in this paper fitting in the industry and the society keeping the respondents in view. Then, feedback and modifications of items from experienced scholars in the area were obtained resulting in an initial set of fifty items to consider for inclusion in the measure. Next, the list of items was examined by a panel of seven experts comprised of mining engineering experts, management scholars, business operators and society scholars who rated the fit of each item to our guiding subject in accordance with the procedure narrated by Hinkin [23]. After approval from the panel, only those items were taken for further considerations which were rated with a mean score of three or higher, eliminating sixteen items (39%) and the measure was modified and reduced to thirty four items in three groups, having items nine ten and fifteen. Thus, the content validity of the proposed instrument was checked that the content of its items reflected the intended variable. For verifying the construct validity of the instrument, six high level CSR professionals of the coal mining industry were tested, and then six junior level mining engineers were also tested with the same instrument. The hypotheses naturally was that high level CSR professionals would show more accurate perception than that of junior level mining engineers. And, the hypothesis was found accepted from the result of tests. After confirming the content validity and the construct validity, two separate pilot studies were undertaken using Likert scale from 1 to 5 ranging from strongly disagree to strongly agree. The first pilot study for improving the measure, based on both quantitative results as well as feed-back from participants, was conducted with a group of twenty engineers from an area of the company. After the study, wordings of four questions were modified without substantially changing the content. Finally, the instrument was developed having three measures, the first containing nine items, the second containing ten items and the third containing fifteen items as shown in Table 1, Table 2 and Table 3.

**Table 1: List of items in Measure 1**

| | |
|---|---|
| q1 | CSR is holistic and integrated approach in the core business strategy of companies; I know. |
| q2 | Business organisations serve the interest of society by taking responsibility for the impact of their activities on the stakeholders and the environment in all aspects of their operations; I know. |
| q3 | It is mandatory for companies in India to participate in the process of development of the society through CSR; I know. |
| q4 | Targeted expenditure on account of CSR in companies in India exceeds 2% of their net profit every year; this I know. |
| q5 | Committees at 3 levels are formed, headed by Directors in company, to formulate, recommend and monitor the activities under CSR and monitor the CSR policy; I know. |
| q6 | Most of the CSR activities are undertaken in local areas in and around the mining fields; I know. |
| q7 | Surplus arising out of the CSR initiatives is not a profit to company; I know. |
| q8 | Business activities should be conducted in a manner that is beneficial to both, business and society; I know. |
| q9 | Spirit of CSR should be understood and imbibed by the employees at all levels and get embedded in the core values of the company; I know. |

**Table 2: List of items in Measure 2**

| | |
|---|---|
| q10 | CSR policy document of my company includes sustainable development commitment; I agree and feel proud. |
| q11 | CSR initiatives creates a good human face to the company; I agree and like. |
| q12 | CSR activities undertaken improved the environmental status of the locality; I agree and feel pleased. |
| q13 | CSR activities are started in locality only after analyzing the baseline survey of the requirements; I agree and like. |
| q14 | External interventions in selecting CSR activities often causes difficulty; I agree and dislike. |
| q15 | Engineering operations of my company are undertaken in a way that they are mutually beneficial to the industry and the society; I agree and appreciate it. |
| q16 | CSR initiatives made it easy to obtain community license to operate for my company; this made my job easy. |
| q17 | CSR initiatives could generate skill in local unemployed population and helped them to have their own businesses; I agree and feel elevated |
| q18 | CSR initiatives could provide educational facilities to poor children, especially girls; I agree and like. |
| Q19 | Frequent interaction with stakeholders made our business operations easy; I agree and commend. |

**Table 3: List of items in Measure 3**

| | |
|---|---|
| q20 | I am involved in atleast one stage of CSR initiatives - selecting, planning, implementation or reporting of CSR initiatives. |
| q21 | Practicing CSR is very interesting to me. I intend to do more on this account. |
| q22 | Skill development practices under CSR generate livelihood to unemployed. |
| q23 | Health and education facilities provided under CSR are making good to society. |
| q24 | NGOs engaged by company for CSR implementation are fulfilling well the objectives. |
| q25 | Donations, grants, funds provided under CSR make good meaning in society. |
| q26 | CSR initiatives are undertaken in line with achieving sustainable development goals. |
| q27 | Practicing CSR is the best tool to get mixed with the community and improve the company's image. |
| q28 | It is better that the company practices CSR through its own mechanism. |
| q29 | Delivering CSR is an excellent way to share the profits of businesses to all stakeholders of the natural capital. |
| q30 | CSR initiatives provide me what you call job satisfaction. |
| q31 | Company's commitment to sustainable development by way of CSR initiatives thrills me for greater job involvement. |
| q32 | Integration of CSR concept in operations of the company makes my job easy. |
| q33 | Practicing CSR is not an extra expenditure to company. It pays back much more than invested. |
| q34 | Annual CSR Report is displayed on the company's website. I have read last year's report. |

In the final pilot study, twenty engineers from other area of the company participated. In order to check internal consistency, Cronbach's coefficient (alpha) was calculated from the final pilot study data. Cronbach's coefficient alpha was found 0.82, 0.91 and 0.97 for the first, the second and the third measures of the instrument respectively; Cronbach's coefficient for the whole instrument was 1.00. This transpired that the instrument was well. Cronbach's coefficient alpha is a reflection of how well the different items complement each other in their measurement of different aspects of the same variable or quality and a coefficient ≥0.70 is considered good.

### 2.3 Design and Procedure

The respondents contained two groups, one of mining engineers at higher level positions in the industry i.e. manager and above, and the another of mining engineers at lower level positions i.e. below manager level who may become manager in future. The respondent group was measured for all the three measures at same time. Responses of engineers were collected at the same time irrespective of their groups but segregated afterwards. The respondents were contacted while off-duty in their area of working. They were narrated the purpose of visit, the instrument sheet was handed over to them and they were requested to tick the options in the instrument on Likert scale from 1 to 5 what they think fit. The filled up instrument was taken aback by hand within 20 minutes. The survey was started in Septemper 2015 and completed in Januaru 2016. The data was compiled on EXEL sheet and analyzed by me.

## 3 Results and Discussions

Response Mean, Response Mode, Average deviation, Standard deviation and Standard Error of Mean (SEM) for all the three measures separately against responses of junior level, senior level and all engineers were calculated as shown in Table 4.

**Table 4: Mean, Mod, Average deviation, Standard deviation and SEM for responses of all the three measures from engineers**

| | Junior level engineers | | | Senior level engineers | | | All engineers | | |
|---|---|---|---|---|---|---|---|---|---|
| | Measure 1 | Measure 2 | Measure 3 | Measure 1 | Measure 2 | Measure 3 | Measure 1 | Measure 2 | Measure 3 |
| MEAN | 4.05 | 3.21 | 2.88 | 4.13 | 3.74 | 3.68 | 4.08 | 3.44 | 3.22 |
| MODE | 5 | 3 | 3 | 5 | 4 | 4 | 5 | 4 | 3 |
| AVDEV | 0.86 | 0.78 | 0.71 | 0.74 | 0.66 | 0.59 | 0.81 | 0.73 | 0.66 |
| STDEV | 1.06 | 0.98 | 0.87 | 0.92 | 0.81 | 0.72 | 1.00 | 0.90 | 0.81 |
| SEM | 0.08 | 0.07 | 0.05 | 0.07 | 0.06 | 0.04 | 0.02 | 0.02 | 0.01 |

The Response Mean with respect to junior level engineers, senior level engineers, and both combined, in Measure 1 was found 4.05, 4.13 and 4.08 respectively; transpiring that the cognitive component of attitudes in engineers was substantially positive than the Expected Mean ≤ 2.5. In probability and statistics, mean value is used to refer to one measure of the central tendency either of a probability distribution or of the

random variable characterized by that distribution. The Response Mean in Measure 2 was found 3.21, 3.74 and 3.44; transpiring that the affective component of attitudes in engineers was positive than the Expected Mean ≤ 2.5. And, the Response Mean of responses in Measure 3 was found 2.88, 3.68 and 3.22; transpiring that the behavioral component of attitudes in engineers was also positive than the Expected Mean ≤ 2.5. In case of junior level engineers, the behavioral component of attitudes was only 2.88; it is a matter of concern.

The mode of responses in Measure 1 for junior, senior and all engineers was 5. Mode is the value that appears most often in a set of data. This reflected that the cognitive component of attitudes towards CSR among mining engineers is quite high in Indian coal mining industry. The Response Mode in Measure 2 was found 3, 4 and 4; transpiring that the affective component of attitudes in most of the engineers was substantially positive, but junior level engineers bear less intensity than that of senior level engineers. The Response Mode in Measure 3 was found 3, 4 and 4; transpiring that the behavioral component of attitudes in engineers was positive, but junior level engineers and engineers in all bear less intensity than that of senior level engineers.

The average deviation, also called the average absolute deviation, is the average of absolute deviations from a central point. It is a summary statistic of statistical dispersion or variability. Standard deviation is a measure of the dispersion of a set of data from its mean. Standard error of mean (SEM) is a measure of precision for an estimated population mean. Low values of average deviation, standard deviation and SEM reflected the survey responses fit.

The mean of responses in all the three measures with respect to junior level engineers, senior level engineers, and all engineers combined exceeded the expected value of attitudes, the null hypothesis is rejected.

In order to better understand the degree of attitudes and defining the improvement area, item-wise data analysis was done. The response frequency, mean and mode in respect of each item is depicted in Table 5 for senior level engineers and in Table 6 for junior level engineers. Against 34 items of the instrument, responses for Strongly disagree, Disagree, Neutral, Agree and Strongly agree, responses from 154 number senior level engineers was 3, 115, 1740, 2041 and 1222 respectively, and from 208 number junior level engineers was 376, 1407, 2432, 1620 and 1237 respectively. This reflected less intensity of positive attitudes among junior level engineers. Low values of average deviation, standard deviation and SEM reflected the survey responses fit and inter-related well.

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**Table 5: Itemwise Frequency, Mean, Mode, Average deviation, Standard deviation and SEM of responses from Senior Level Engineers**

| Senior Level Engineers | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | FREQUENCY | | | | | MEAN | MODE | AVDEV | STDEV | SEM |
| | SD | D | N | A | SA | | | | | |
| q1 | 0 | 0 | 0 | 12 | 142 | 4.92 | 5 | 0.14 | 0.27 | 0.022 |
| q2 | 0 | 0 | 0 | 33 | 121 | 4.79 | 5 | 0.34 | 0.41 | 0.033 |
| q3 | 0 | 0 | 0 | 84 | 70 | 4.45 | 4 | 0.50 | 0.50 | 0.040 |
| q4 | 0 | 8 | 89 | 37 | 20 | 3.45 | 3 | 0.67 | 0.78 | 0.063 |
| q5 | 3 | 16 | 82 | 20 | 33 | 3.42 | 3 | 0.83 | 1.00 | 0.081 |
| q6 | 0 | 8 | 58 | 77 | 11 | 3.59 | 4 | 0.61 | 0.70 | 0.057 |
| q7 | 0 | 0 | 12 | 25 | 117 | 4.68 | 5 | 0.48 | 0.61 | 0.049 |
| q8 | 0 | 24 | 9 | 53 | 68 | 4.07 | 5 | 0.82 | 1.06 | 0.085 |
| q9 | 0 | 1 | 64 | 61 | 20 | 3.81 | 3 | 0.69 | 0.86 | 0.070 |
| q10 | 0 | 1 | 0 | 65 | 88 | 4.56 | 5 | 0.50 | 0.54 | 0.043 |
| q11 | 0 | 0 | 17 | 60 | 77 | 4.39 | 5 | 0.61 | 0.68 | 0.055 |
| q12 | 0 | 0 | 21 | 110 | 23 | 4.01 | 4 | 0.29 | 0.54 | 0.043 |
| q13 | 0 | 38 | 102 | 14 | 0 | 2.84 | 3 | 0.42 | 0.56 | 0.045 |
| q14 | 0 | 9 | 76 | 69 | 0 | 3.39 | 3 | 0.55 | 0.60 | 0.048 |
| q15 | 0 | 14 | 45 | 63 | 32 | 3.73 | 4 | 0.74 | 0.89 | 0.072 |
| q16 | 0 | 0 | 36 | 95 | 23 | 3.92 | 4 | 0.43 | 0.62 | 0.050 |
| q17 | 0 | 14 | 103 | 37 | 0 | 3.15 | 3 | 0.41 | 0.56 | 0.045 |
| q18 | 0 | 0 | 50 | 69 | 35 | 3.90 | 4 | 0.59 | 0.74 | 0.060 |
| q19 | 0 | 0 | 90 | 47 | 17 | 3.53 | 3 | 0.61 | 0.69 | 0.055 |
| q20 | 0 | 13 | 80 | 61 | 0 | 3.31 | 3 | 0.55 | 0.62 | 0.050 |
| q21 | 0 | 22 | 56 | 76 | 0 | 3.35 | 4 | 0.64 | 0.72 | 0.058 |
| q22 | 0 | 20 | 94 | 40 | 0 | 3.13 | 3 | 0.45 | 0.61 | 0.049 |
| q23 | 0 | 0 | 44 | 76 | 34 | 3.94 | 4 | 0.53 | 0.71 | 0.057 |
| q24 | 0 | 0 | 56 | 67 | 31 | 3.84 | 4 | 0.61 | 0.74 | 0.059 |
| q25 | 0 | 0 | 48 | 77 | 29 | 3.88 | 4 | 0.55 | 0.70 | 0.056 |
| q26 | 0 | 0 | 57 | 73 | 24 | 3.79 | 4 | 0.58 | 0.70 | 0.056 |
| q27 | 0 | 20 | 57 | 70 | 7 | 3.42 | 4 | 0.68 | 0.77 | 0.062 |
| q28 | 0 | 0 | 46 | 61 | 47 | 4.01 | 4 | 0.61 | 0.78 | 0.063 |
| q29 | 0 | 7 | 49 | 71 | 27 | 3.77 | 4 | 0.65 | 0.79 | 0.064 |
| q30 | 0 | 0 | 64 | 68 | 22 | 3.73 | 4 | 0.60 | 0.70 | 0.056 |
| q31 | 0 | 0 | 46 | 61 | 47 | 4.01 | 4 | 0.61 | 0.78 | 0.063 |
| q32 | 0 | 7 | 49 | 71 | 27 | 3.77 | 4 | 0.65 | 0.79 | 0.064 |
| q33 | 0 | 0 | 64 | 68 | 22 | 3.73 | 4 | 0.60 | 0.70 | 0.056 |
| q34 | 0 | 8 | 68 | 70 | 8 | 3.51 | 4 | 0.60 | 0.68 | 0.055 |

**Table 6: Itemwise Frequency, Mean, Mode, Average deviation, Standard devition and SEM of responses from**

**Junior Level Engineers**

| Junior Level Engineers | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | FREQUENCY | | | | | MEAN | MODE | AVDEV | STDEV | SEM |
| | SD | D | N | A | SA | | | | | |
| q1 | 0 | 0 | 0 | 32 | 176 | 4.85 | 5 | 0.26 | 0.36 | 0.025 |
| q2 | 0 | 0 | 0 | 45 | 163 | 4.78 | 5 | 0.34 | 0.41 | 0.029 |
| q3 | 0 | 0 | 0 | 118 | 90 | 4.43 | 4 | 0.49 | 0.50 | 0.034 |
| q4 | 13 | 9 | 107 | 59 | 20 | 3.31 | 3 | 0.72 | 0.93 | 0.065 |
| q5 | 27 | 31 | 105 | 10 | 35 | 2.98 | 3 | 0.80 | 1.18 | 0.082 |
| q6 | 0 | 23 | 64 | 111 | 10 | 3.52 | 4 | 0.66 | 0.75 | 0.052 |
| q7 | 0 | 0 | 14 | 33 | 161 | 4.71 | 5 | 0.45 | 0.59 | 0.041 |
| q8 | 0 | 23 | 9 | 55 | 121 | 4.32 | 5 | 0.79 | 0.99 | 0.068 |
| q9 | 13 | 11 | 130 | 32 | 13 | 3.23 | 3 | 0.70 | 1.02 | 0.071 |
| q10 | 0 | 19 | 40 | 58 | 91 | 4.06 | 5 | 0.82 | 1.00 | 0.069 |
| q11 | 0 | 0 | 58 | 87 | 63 | 4.02 | 4 | 0.59 | 0.76 | 0.053 |
| q12 | 0 | 0 | 122 | 86 | 0 | 3.41 | 3 | 0.49 | 0.49 | 0.034 |
| q13 | 41 | 109 | 58 | 0 | 0 | 2.08 | 2 | 0.51 | 0.69 | 0.048 |
| q14 | 0 | 122 | 86 | 0 | 0 | 2.41 | 2 | 0.49 | 0.49 | 0.034 |
| q15 | 0 | 13 | 76 | 87 | 32 | 3.66 | 4 | 0.69 | 0.81 | 0.056 |
| q16 | 0 | 64 | 51 | 80 | 13 | 3.20 | 4 | 0.84 | 0.95 | 0.066 |
| q17 | 13 | 9 | 107 | 59 | 20 | 3.31 | 3 | 0.72 | 0.93 | 0.065 |
| q18 | 13 | 9 | 107 | 59 | 20 | 3.31 | 3 | 0.72 | 0.93 | 0.065 |
| q19 | 27 | 68 | 87 | 13 | 13 | 2.60 | 3 | 0.81 | 1.00 | 0.069 |
| q20 | 41 | 109 | 58 | 0 | 0 | 2.08 | 2 | 0.51 | 0.69 | 0.048 |
| q21 | 41 | 109 | 58 | 0 | 0 | 2.08 | 2 | 0.51 | 0.69 | 0.048 |
| q22 | 0 | 122 | 86 | 0 | 0 | 2.41 | 2 | 0.49 | 0.49 | 0.034 |
| q23 | 0 | 13 | 76 | 87 | 32 | 3.66 | 4 | 0.69 | 0.81 | 0.056 |
| q24 | 0 | 64 | 51 | 80 | 13 | 3.20 | 4 | 0.84 | 0.95 | 0.066 |
| q25 | 13 | 9 | 107 | 59 | 20 | 3.31 | 3 | 0.72 | 0.93 | 0.065 |
| q26 | 13 | 9 | 107 | 59 | 20 | 3.31 | 3 | 0.72 | 0.93 | 0.065 |
| q27 | 27 | 68 | 87 | 13 | 13 | 2.60 | 3 | 0.81 | 1.00 | 0.069 |
| q28 | 0 | 13 | 76 | 87 | 32 | 3.66 | 4 | 0.69 | 0.81 | 0.056 |
| q29 | 0 | 64 | 51 | 80 | 13 | 3.20 | 4 | 0.84 | 0.95 | 0.066 |
| q30 | 13 | 9 | 107 | 59 | 20 | 3.31 | 3 | 0.72 | 0.93 | 0.065 |
| q31 | 13 | 9 | 107 | 59 | 20 | 3.31 | 3 | 0.72 | 0.93 | 0.065 |
| q32 | 27 | 68 | 87 | 13 | 13 | 2.60 | 3 | 0.81 | 1.00 | 0.069 |
| q33 | 41 | 109 | 58 | 0 | 0 | 2.08 | 2 | 0.51 | 0.69 | 0.048 |
| q34 | 0 | 122 | 86 | 0 | 0 | 2.41 | 2 | 0.49 | 0.49 | 0.034 |

Mean and mode of item-wise responses (Figure 1) reflected the area of concern requiring urgent attention for improving the degree of attitudes.

Responses of junior level engineers against (i) Item q13: CSR activities are started in locality only after analyzing the baseline survey of the requirements; I agree and like, (ii) q14: External interventions in selecting CSR activities often causes difficulty; I agree and dislike, (iii) q20: I am involved in atleast one stage of CSR initiatives - selecting, planning, implementation or reporting of CSR initiatives, (iv) q21: Practicing CSR is very interesting to me. I intend to do more on this account, (v) q22: Skill development practices under CSR generate livelihood to unemployed, (vi) q33: Practicing CSR is not an extra expenditure to company. It pays back much more than invested, and (vii) q34: Annual CSR Report is displayed on the company's website. I have read last year's report, could get mean and mode below the expected value. Even, the responses from senior level executives were not much above the expectation against these items.

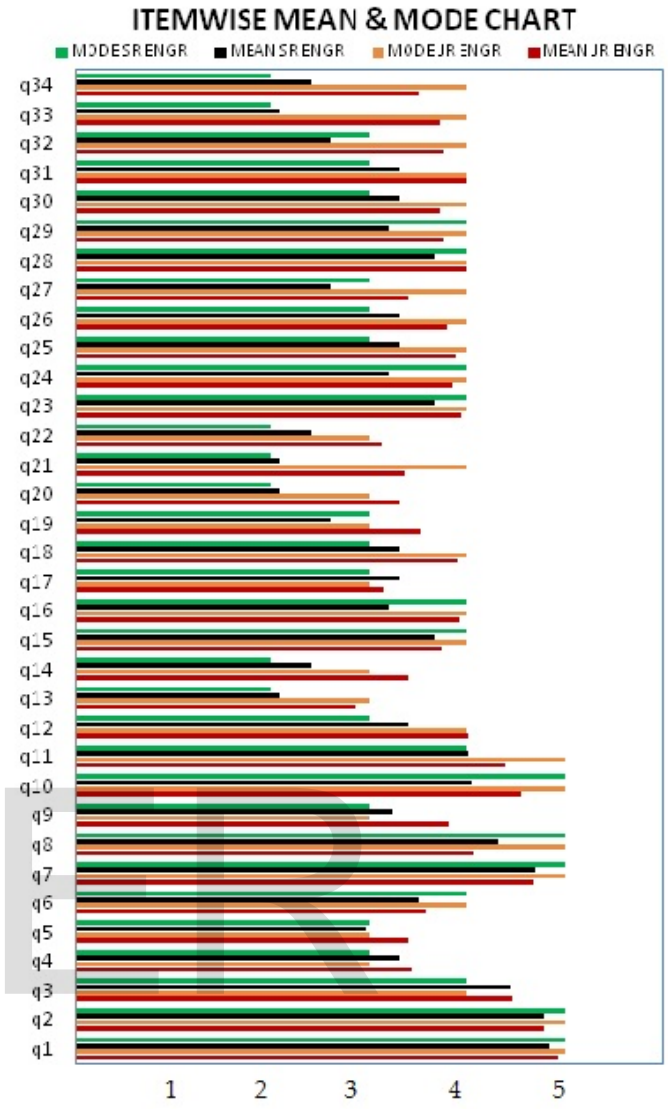


**Figure 1: Intensity of Attitudes towards Each Item**

Responses of junior level engineers against (i) Item q13: CSR activities are started in locality only after analyzing the baseline survey of the requirements; I agree and like, (ii) q14: External interventions in selecting CSR activities often causes difficulty; I agree and dislike, (iii) q20: I am involved in atleast one stage of CSR initiatives - selecting, planning, implementation or reporting of CSR initiatives, (iv) q21: Practicing CSR is very interesting to me. I intend to do more on this account, (v) q22: Skill development practices under CSR generate livelihood to unemployed, (vi) q33: Practicing CSR is not an extra expenditure to company. It pays back much more than invested, and (vii) q34: Annual CSR Report is displayed on the company's website. I have read last year's report, could get mean and mode below the expected value. Even, the responses from senior level executives were not much above the expectation against these items.

Responses of junior level engineers as well as senior level

engineers against (i) q4: Targeted expenditure on account of CSR in companies in India exceeds 2% of their net profit every year; this I know, (ii) q5: Committees at 3 levels are formed, headed by Directors in company, to formulate, recommend and monitor the activities under CSR and monitor the CSR policy; I know, q9: Spirit of CSR should be understood and imbibed by the employees at all levels and get embedded in the core values of the company; I know, q18: CSR initiatives could provide educational facilities to poor children, especially girls; I agree and like, and q19: Frequent interaction with stakeholders made our business operations easy; I agree and commend, could get mean and mode marginally above the expected value.

Other items showed a mode of 4 or 5, and mean value above three, indicating highly positive attitude towards the items.

CSR is supposed to be an ongoing, regular, daily activity of business organizations. The results reflect how the industry is practicing CSR. The Government-owned coal mining industry has comprehensive policy frameworks and standardized management system to fulfill the legal requirements of CSR and sustainability. Comprehensive legislation on environment protection also exists in India since decades. But, the successful implementation of the concepts are doubtful when a large proportion of managers (mining engineers in case of Indian coal mining industry) bear low intensity positive attitudes towards CSR. A structured way of working towards continual improvements in integrating CSR with core business operations of the industry and involvement of all employees as well as community in practices is required urgent; this is legal requirement also. CSR activities as required by low should normally focus on local issues; whereas it appeared from the results that most of the junior engineers who are normally posted in fields of operation of the industry are unaware. Most of them never got an opportunity to get them involved and feel the joy of CSR. As they could never taste the feelings, most of them find CSR an un-interesting activity. Most of the engineers have never come across the CSR report of the company; neither they are aware of the expenditures made or initiatives taken under CSR. Some of the engineers do not know how aan CSR activity is selected and undertaken. A good proportion of engineers feel skill development programs under CSR did not provide employment to local population. Most of these engineers are either manager at present or will become manager in future. The results reflect concern on their part.

The results reflected that a large proportion of engineers bear a substantially positive cognitive and affective components of attitudes. This indicated that there exists sufficient potential for their translation into behavioral component of attitudes. The concept of CSR and sustainability will get implemented by the industry through this in a better way.

## 4 Conclusions

The international expectations and legislative requirements are clearly spelt in respect of CSR, but its success largely depends on the high intensity positive attitudes of the mining engineers (managers) of the industry because how the CSR initiatives are decided, integrated and implemented in the core business activities largely depend upon managers of the industry. In the instant evaluation, the degree of cognitive component of attitudes among mining engineers of Indian coal mining industry has been found substantially positive, the affective component of attitudes has also been found marginally positive; but behavioral component of attitudes require enhancement. The industry can do it through more involvement of engineers in CSR activities. The study has earmarked certain areas towards which less positive attitudes have been measured; those areas attract concern and require urgent attention of the management. Integration of CSR with all business activities in a way that they are conducted in a manner that is beneficial to both, the business and the society, can cause enhancement of behavioral component of attitudes towards CSR.

The study is expected to enhance the positive attitudes towards CSR in the industry and to make the stakeholders understand the changes required for achieving the objectives of CSR.



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