



# Evaluation Minimizes the Way of Shortage of Quantity of Coal Through the Quality Analysis at Customers End

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**Abstract:** The mineral means that coal its differ from the other minerals due to the different properties and heterogeneity character basically coal is divide four category i.e peat, bituminous, lignite and anthracite 'Coal' is one of the primary sources of energy accounting for about 80.7% of coal production for the total energy consumption in the country. India has some of the largest reserves of coal in the world. Indian coal has high ash content and low calorific value. However, with the present rate in India where approximately 52% primary commercial energy is coal dependant coal India alone meets to the tune of 40% of primary commercial requirement and commands 74% of the Indian coal market and its feed 82 out of 86 coal based thermal power plants in India, in accounts for 76% of total thermal power generating capacity of the utility sector and supplies coal at price the discounted to international prices, reserves coal likely to last over 90 years. The energy derived from coal in India is about twice that of energy derived from other sources, where energy derived from coal is about higher than energy derived from oil. Country produce electricity using oil, coal solar, wind and they import coal like the country Australia, China, Indonesia & South Africa. The Odisha, West bengal, Assam, Bihar, Jharkhand, Chhattisgarh, Madhay pradesh, Andhra pradesh, Gujarat and Tamil nadu are the coal reserve states in India. Coals are used regularly for generation of heat but due to globalization the proper assessment both the quality and quantity is most important for modern industry and environmental conservation. In this research we used different instruments and for the spectroscopic analysis used FTIR and ESI-MS and express the difficulties are going on and how it direct impact to economy and environment.

**Keywords:** Economy, Environment, Logistic Loss, Inflation, Customers

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## 1. Introduction

The chemistry that analytical involved the exact evaluation and the utilization of coal how much and how the coal used in the recent years [1-5] as with a high degree of sophistication, their some easy testing and sampling procedure were inherent as according the nature of materials and being its uses. Coals are a carbonized compound that some coal has high amount of carbon and some have low carbon content [6]. Simply we can described that coal is burn or at best carbonize, according to the studies of science then there is basically two technology's are developed that one is combustion and second is carbonization or the materials should consumed in different.

In India according to my subject the main work should be the conservation of coal in proper process and the quality of coal maintain the high degree of accuracy, the better quality of coal we can find for its best blending technology's that the resultant quality of coal plays the different character and different grades. "Coal quality" is the term used to refer to the properties and characteristics of coal that influence its behavior and use [1, 7, 8]. Among the coal-quality characteristics that will be important for future coal use are the concentrations, distribution, and forms of the many elements contained in the coal that we intend to burn and "coal quantity" that when the coal is burn how much quantity of coal needs to rise the degree of heat. When the coal is burn it's directly associated with the environmental

condition and its effect its atmospheric pollution [9], the pollution resulting the coals containing the carbon, sulfur and some trace element [10], but now a days the clean coal technology developed somehow save the environment. In India the stacking and the coal reservoir procedure is too different that's why the shortage of quantity is factor affecting to the system [11].

The geographical sense of coal is a black rock but not mineral, why coal is not a mineral, mineral is a inorganic homogeneous substances with a definite chemical composition but coal is organic sedimentary black rock it has no chemical composition and has hetero organic and inorganic character, it compact stratified mass of metamorphosed plants which suffered decay by the pressure and temperature as according to the nature its shows their exist deposition and coalification and the extraction of coal depends upon the blending that the quality characteristic to enhance their grades [12, 13].

The simplified description of the origin of coal that serve to explain the principal variations in vast reserves of coal in the worlds for the utilization of the coal that commercial use depends upon the scientific classifications and the classification of coal dependents upon the physical, chemical and fundamental properties [14-16]. The primary difference of plant derbies are depends upon the codification. In the introductory chapter, we have discussed the rationale of the study, the importance of coal industry in general have also explained there the objectives of the research study. The purpose of the present chapter literature review is to provide a brief description of the research work done in the field which i have surveyed and examined to identify the research gap that exists and to give an idea about the research problem to be dealt with us. Literature Review is an important step in a research work. In order point to mark the scope and direction of research. A research scholar has to make an in-depth study of various researches in the field of his investigation [17]. It is a fact that knowledge of relevant research works done by earlier research scholars not only helps a new research scholar to know his field of study well but also to avoid duplication of work, I understanding the various studies done earlier in the field provides to identify the research gap. Once the new researcher knows the gap in the field of his research work or knows his area where he can performs and he gets motivated morally with happiness in interpreting the significance of his own findings or discovery.

Hence, for a new researcher it is highly beneficial to go through the earlier studies, which are similar or closer to the study to be undertaken by the researcher. However, it may be noted here that specific studies on customer whose are using the coal from coal India or imported for that matter I did not found the direct relation of research between the quality and the quantity of the commodity in customer end an attempt has been made to present a review of the important studies done in the related areas to find out the research gap that exists in the area of investigation and to locate the niche for our own study.

In their article titled '*The effect of vibration on dry coal*

*beneficiation in the reflux classifier*' have emphasized the result of an experiment of the application of dry beneficiation technology to the separation of coal and mineral matters in a novel air-fluidized bed. They took up the Reflux Classifier (RC) which was an innovative design that incorporated an inclined zone above a conventional fluidized bed to achieve increased segregation rates and a higher throughput than separators with an equivalent footprint. They evaluated the effectiveness of magnetite and sand as dense media for the separation of coal in an air-fluidized RC. The effect of vibrations on the separations obtained using both these media was also examined. They concluded that the sand medium with vibration used in this work, produced much better separations than in previous work using no vibration and a magnetite medium [18]. In their article titled '*Renewable energy resource assessment of Tripura for power generation*' has stated that the progress of the society largely depends on the resources available to it. They have stated that the energy situation in the state of Tripura, remote part of northeastern region of India is characterized by low quality of fuel, low efficiency of use, low reliability of supply and limited access leading to lower productivity of land, water and human beings. This ultimately results in low quality of life and environmental degradation. The present study examines the renewable resources available in the state, which can be harnessed to generate power and gives a plausible solution to both demand and supply side pressures on the electric grid. It is concluded that immediate steps need to be taken for the development of all probable and renewable sources of energy in the northeast. The geographical and climatic conditions of the north-east states especially Tripura indicate that this region has the potential for developing solar and bio-mass based energy. Thus, if this is properly planned and integrated, it would give energy security [19]. In his article titled '*Assessment of Environmental Impacts of Overburden Dumps in Mining Areas*' has stated that one of the major environmental challenges is to manage and handle the huge volume of overburden generated in open cast mines, which is associated with the aesthetic, visual impacts and landslides, soil erosion, water and air pollution, etc. In addition, it makes a marked change in the land use and thus the challenge lies in developing suitable land use. The researcher, however, has suggested various techniques for overburden disposal. These include: (1) utilization of the overburden and mine waste by backfilling to help in reclamation, restoration and rehabilitation of the terrain without affecting the drainage and water regimes (2) dumping over-burden and wastes in available low-lying areas accompanied by leveling and providing soil cover to utilize the land profitably (3) use of wastes as road metal after crushing to proper size if considered suitable, (4) proper grading of the overburden dumps and terracing with contour drainage as necessary accompanied by stabilization of the slopes and proper vegetation [20]. In another study article titled has '*extensively investigated the social and environmental impacts of coal mining*' in India and examined the remedial measures taken up by different mining companies to mitigate problems

arising out of these impact. He has observed that the biggest environmental challenge facing the coal industry is the issue of greenhouse gases and acid rain. The researcher has concluded that in spite of its environmental problems coal is the only natural resource and fossil fuel, which is available in abundance in India. Accordingly, coal will remain a future mainstay, a foundation and the main energy for the economic growth of the country. Thus, the challenge is to apply right technology in the most efficient and environmental friendly way to strike a balance between mineral developments on the one hand and the restoration of the environment on the other [21, 22]. In his article titled '*The decomposition of energy-related carbon emission and its decoupling with economic growth in China*' In order to find the efficient ways to reduce carbon emission intensity in China, we utilize the LMDI method to decompose the changes of China's carbon emissions and carbon emission intensity from 1996 to 2010, from the perspectives of energy sources and industrial structure respectively. Then we introduce the decoupling index to analyze the decoupling relationship between carbon emissions and economic growth in China. The results indicate that, on the one hand, economic growth appeared as the main driver of carbon emissions increase in the past decades, while the decrease of energy intensity and the cleaning of final energy consumption structure played significant roles in curbing carbon emissions; meanwhile, the secondary industry proved the principal source of carbon emissions reduction among the three industries and had relatively higher potential [23]. On the other hand, when the decoupling relationship is considered, most years during the study period saw the relative decoupling effect between carbon emissions and economic growth, which indicated that the reduction effect of inhibiting factors of carbon emissions was less than the driving effect of economic growth, and the economy grew with increased carbon emissions; there appeared the absolute decoupling effect in 1997, 2000 and 2001, which implied that the economy grew while carbon emissions decreased; whereas no decoupling effect was identified in 2003 and 2004. In his article titled '*The decoupling of energy use and industrial output in the Asian region*' particularly with respect to developing countries, we found little information about most country programs other than for China and India and only one article that compared the programs of these two countries. For this reason, we used diverse sources to identify the key programmatic features that have contributed, but clearly are not totally responsible for, decoupling achievements of two countries (China and Thailand) and then, on Asian developing countries have very different rates of decoupling. The two successful on-going programs share three common features. These are quantitative targets, supportive programs and industry involvement [24]. The four emerging programs lack some or all of these features. In his article titled '*An examination of the relationship between energy consumption and performance of transportation sector in Malaysia, output multipliers approach*' The objective of the current study is to investigate the energy consumption and the performance of

Malaysia's transportation sector. It applied output multiplier approach which is based on input-output model. Three input-output tables of Malaysia covering the 1991, 2000 and 2005 periods were used. The results indicate significant changes in the output multipliers of the transportation sector for the (1991–2005) period. Also, the transportation-to-energy subsector multipliers were found to increase over time. The increasing importance of transportation sector to the development of Malaysian economy resulted in a noticeable increase in the consumption of each energy subsector's output especially 'petrol and coal industries' products. Based on the research findings, several policy implications were suggested for the betterment of both sectors' performance and generally for the improvement of Malaysian economy [25]. In his article titled '*Decomposing the changes of energy-related carbon emissions in China*' evidence from the PDA approach, In order to investigate the main drivers of CO<sub>2</sub> emissions changes in China during the 11th Five-Year Plan period (2006–2010) and seek the main ways to reduce CO<sub>2</sub> emissions, we decompose the changes of energy-related CO<sub>2</sub> emissions using the production-theoretical decomposition analysis approach. The results indicate that, first, economic growth and energy consumption are the two main drivers of CO<sub>2</sub> emissions increase during the sample period; particularly in the northern coastal, northwest and central regions, where tremendous coal resources are consumed, the driving effect of their energy consumption on CO<sub>2</sub> emissions appears fairly evident. Second, the improvement of carbon abatement technology and the reduction in energy intensity play significant roles in curbing carbon emissions, and comparatively the effect of carbon abatement technology proves more significant. Third, energy use technical efficiency, energy use technology and carbon abatement technical efficiency have only slight influence on CO<sub>2</sub> emissions overall. In the end, we put forward some policy recommendations for China's government to reduce CO<sub>2</sub> emissions intensity in the future [26].

## 2. Objectives for Reported Articles

After the review this is most important for me as scholars to justify the needs for my own research for the way of critical evaluating of previous research. It involves both a statement of personal judgment or analysis and put the values. My experience over the years of quality analysis and supervision indicates that many customers faced a lot of problems but didn't express their actual difficulties for their evaluation; this seems to result from. Although many appear proficient in their analysis; but quite often they find it difficult to maintain that expert identity in their use of critical data, I examine the problems of the customer and supplier, I placed my analyzed data and placed the technique how though the quality analysis we adopted the use of critical thinking and find out the solution of the problem and save our environment and also minimize the inflation. I found that quite significant number of gaps in previous research work from their sampling and stacking of commodity, hope I resolve conflicts amongst seemingly

contradictory previous of research show insight and an awareness of differing techniques, that's why we to determine the:-Analyze the quality of coal only its proximate, ultimate & GCV.

- (1) Special sample taken for Total moisture analysis
- (2) Data compare with freshly mined and stacking coal.
- (3) Find out the solution to how minimize the loss of quantity.
- (4) Minimize the inflation and production of toxic gases for environment.
- (5) Developed the technique for proper stacking.

### 3. Collection and Identification of Samples

The Coal samples was collected in the Month of 1<sup>st</sup> May to 20<sup>th</sup> of December randomly and identifying the collected Samples and the samples are prepared and taking for analysis following the proper procedure, The samples are collected as Freshly Mined coal, Freshly Mined coal in Monsoon, Stacking coal i.e. Period of Stacking (3, 6, 8 months). Samples are collected as per standard collection procedure i.e IS 436 (Part 1/Sec 1) -1964, Clause no-6 and the Samples are prepared as per the IS 436 (Part 1/Sec 1) -1964, Clause no-10. After the final preparation of the samples the samples are ready for analysis and the size of the coal samples is 212 miron but and collect the different samples for Total Moisture Analysis.

### 4. Results and Discussion

Table summarized the results of fresh mined coal, Col monsoon, Stack three, six and eight month's coal

*Table 1. Fresh mined coal.*

Name of Parameters	Results
TM	13.13%
IM	8.20%
VM	26.63%
ASH	21.80%
FC	43.37%
GCV	5389 Kcal/kg
C	62.13%
H	4.02%
S	0.65%
N	1.04%

*Table 2. Fresh mined coal monsoon.*

Name of Parameters	Results
TM	19.40%
IM	9.60%
VM	27.90%
ASH	24.12%
FC	38.38%
GCV	5187 Kcal/kg
C	54.61%
H	4.89%
S	0.89%
N	0.97%

*Table 3. Stack 03 months coal.*

Name of Parameters	Results
TM	10.74%
IM	6.06%
VM	22.97%
ASH	29.28%
FC	41.69%
GCV	5173 Kcal/kg
C	55.82%
H	3.65%
S	0.46%
N	0.57%

*Table 4. Stack 06 months coal.*

Name of Parameters	Results
TM	12.95%
IM	7.66%
VM	20.62%
ASH	31.02%
FC	40.70%
GCV	4980 Kcal/kg
C	53.02%
H	4.03%
S	0.62%
N	0.69%

*Table 5. Stack 08 months coal.*

Name of Parameters	Results
TM	8.80%
IM	6.14%
VM	20.45%
ASH	35.00%
FC	38.41%
GCV	4434 Kcal/kg
C	46.89%
H	3.09%
S	0.43%
N	0.69%

Research analyze samples collected from the stock coal and analyze the parameters the results are shown above that how the effect caused to the materials and how the parameters are changed in the atmospheric condition the change of parameters are shows different results as per the character of coal from the analysis that the most effective part is Total moisture, Gross calorific value and Ash in the comparative chart it clear that loss of weight of coal is maximum in monsoon due to high Total moisture when the stacking coal period is slowly rise than the effect of atmospheric whether condition the coal catch fire with slow and steady way the coal changed the parametric characters but this is only happen due to wrong procedure of handling of coal in the stacking yard the fallen of GCV in a short period of time directly impact to the coal stock in the yard if the heat value fall more quantity needs to raise the temperature and more use of commodity more handling charges.

The logistic loss, handling loss and the stacking loss of the quantity of coal is called the total loss of the quantity, the loss of quantity means to use of more commodity as per the requirements of the plants my analyze results indicates how

the total loss happened.

## 5. Conclusion

Research is such a typical word that sometimes creates the some problems to choose and work for such a topic i.e. someone can be committed before, so it's necessary to check and shut out the problem as per the proper research process which is applicable for the and obeying the guidance of union grant commission, government of India and the precaution should be that the topic and objective are directly proportional to each other. In my research samples are collected and analyze by self and putting the result in my paper, before going to start my pre-research read different article of the research scholar and find the gap of research and select a topic. When I collect the sample taking the precaution that the coals are in the same stock where my own analyze results how differ from one other after the period time. Due to the movement of rake in the monsoon we get more wet coal this is directly indicate the loss of quantity due to heavy moisture graphically I shows it in my results. Ex- A Party purchase 1000 mt of coal but in dry season and another 1000 mt of coal in monsoon, the dry Coal TM = 13.13% and the Monsoon = 19.40%, the difference is 6.27%, it means it shows directly that from 100 mt of coal there 6.27 mt of coal shortage, if the customer purchase Rs. 5000.00 per ton it means direct loss of the customer Rs. 31350.00. In my research am using various instruments and shows the spectroscopic analysis of the samples.

I already stated the analytical needs evaluation and quality control and utilization as according to the process and analyzed, primarily data displayed, I had collected samples randomly and every data should analyzed and comparing the data implies to the efficiency and how effect the quantity and inflation are directly proportional to each other and another important factor if in stock coal catch fire don't use water to control the fire the ideas that separate the fired coal from the stock, hence all data shows in my future work in systematically for further research.

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