Coal Resources of Deoghar District (Santhal Pargana) Jharkhand

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Abstract

Three detached basins Jainti, Shaharjuri and Kundit kuriah comprise the Deoghar group of coalfields. Jainti coalfield is the westernmost coalfields of Deoghar. It comprised three sub basin *i.e.* Khamarbad, Banskupi and Deoghar subbasin. Shaharjuri coalfield contains coal seam of Karharbari as well as Barakar Formations. Kundit Kuriah coalfield is the smallest coalfield of the Deoghar group. It has three coal seams with in karharbari Formation. Chemically coal consists of a mixture of complex organic compounds alongs with small amount of inorganic mineral matter and moisture. The proximate analysis includes moisture content, volatile matters content, Ash, fixed carbon and caloritic value. Talchir sandstones are medium to fine grained, hard, compact, grey to grey-green coloured. They contain quartz and feldspar as minarals. The occurrence of fleshred, unaltered feldspar mineral indicates the formation of rock, under cold climatic conditions. Needle shaped shales containing varve structure is also indicator of variation in conditions of deposition. The occurrence of coal and plant fossils in the area yellow, brown and brown-red sandstones in the area suggest the presence of hot climates, these evidence are the proof of changes in geological past which resulted in the formation of variors types of minerals. Qualitatively moisture and ash content of the coal seam ranges from 2.2 to 4.2% and 9.5 to 22.0% respectively. The workable coal has not been assessed. Shaharjuri coalfield contains coal seam of Karharbari as well as Barakar Formation. The study of coals suggests the Deoghar district contain high ash, and low moisture content. There is frequent parting in them. They were deposited in cold humid tropical climate conditions and fluvial and swampy environment.

Keywords : *Coal, Minerals, Sandstones, Ash and Environment etc*

Introduction

The first published work on the rocks of the area Jainti is by Hughes (1871). The occurrence of coal in Deoghar area, Santhal Pargana, originally in Birbhum District of Bengal was brought in notice as early as 1853 by T.W.H. Hughes of Geological Survey of India. He described the outlier and noted the poor quality of coal as obtained from the out crops of Jainti coalfield.

The area around Deoghar consists of Archaeon and Lower Gondwana rocks. The Archaens are said to be the oldest rock formations on the earth. Its age has been estimated to be more than 3700 to 4700 million years old. Once upon a time it was the part of Antarctica. About 200 million years ago due to plate tectonics *i.e.* rifting and drifting of the crust of the earth, this area departed from south pole. Before continental drifting, the area was a part of Gondwana land which constitutes presently Australlia, India, South Africa and South America. The drifting and rifting of these continents took millions of years and they faced changes in their climatic conditions starting from each other various geological and geomorphological changes took place. On plate boundaries, new minerals were formed. Coal formation started at the end of Glaciation. The evidences of glacier and glaciation still exist in the various coal fields. A special type of rock. *i.e.* Talchir sandstone and shales occur in Jainti, Shaharjuri and Kundit area.

Talchir sandstone are medium to fine grained, hard, compact, grey to grey-green coloured, they contain quartz and feldspars as minerals. The occurrence of fleshred, unaltered feldspar mineral indicates the formation of rocks, under cold climatic conditions. Needle shaped shales containing varve structure is also indicator of variation in conditions of deposition. The occurrence of coal and plant fossils in the area yellow, brown and brown red sandstones in the area suggest the presence of hot climate, these evidence are the proof of changes in geological past which resulted in the formation of various types of minerals.

As per record available, only quartz and feldspar are obtained here on commercial basis. However the ancient crystalline rocks contain granite, gneisses, and schist. They may be further investigated for obtaining valuable economic minerals. They may be used for decorative purposes after grinding and polishing. Granite is used as building stones.

Deoghar Group of coalfields

Three detached basins Jainti, Shaharjuri and Kundit Kuriah comprise the Deoghar group of coalfields.

Coals of these coalfields are high volatile, non-coking to poorly cooking sub bituminous type.

Jainti coalfield is the westernmost coalfields of Deoghar. It comprises three sub-basins *i.e.* Khamarbad, Banskupi and Deoghar sub-basins, the thickness of each basin is variable and divided into parts. Thus, they are defined by seam numbers or by top, middle and bottom seams. At one time this coalfield was considered to be the most important coalfield of the Deoghar group of coalfields.

Shaharjuri coalfield contains coal seam of Karharbari as well as Barakar Formations.

Kundit Kuriah coalfield is the smallest coalfield of the Deoghar group. It has three coal seams with in Karharbari Formations.

Literature Survey

The occurrence of coal in Deoghar area of Santhal Pargana, originally in the Birbhum District of Bengal was first brought in notice as early as 1853 by T.W.H. Hughes of Geological survey of India. He described the outlier and noted the poor quality of the coal.

Mr. Sandys (1867) District Magistrate of Bhagalpur issued a project report in which he explained the position and quality of coal and pointed out the facilities that existed for its transport. The position of the coalfield he thought, "will naturally command the market for coal in the North-Western direction when both chord and loop line work together,'' and he had ''little doubt that in a few year, all the coal that could be raised in such a position, whether East or west of the chordline would in full demand. Hughes (1871).

With these sanguine views of Mr. Sandys, the geologist of G.S.I were unable to criticise, an examination of the rocks having proved that however favorable the position of the outlier they would never be of much importance owining to the poor quality of the coal they contained, and the limited area, over which it occurred so that no successful competition with the Karharbari field even locally could be initiated for years to come.

The next mention of this coalfield is to be found in Ball and Sampson's (1913) report, well described in Geological Survey of India publication. They corroborated the sediments made by Hughes (1871). They further noted that the mining work was in full swim in two mines in the area 1909.

Dr. Fox (1934) visited the area and reported the mining activities of the area.

Chatterjee (1936) made a detailed mapping of the Jainti coalfield in Nov. 1934. He discussed the geological features of the some extent that made a landmark in the history of Deoghar coalfield. He carried out mapping work on the topographic map Survey of India (1'-1Mile) .

Datta, Das, Mukherjee and Roy (2000) reported that three detached basins viz. Jainti, Shaharjuri and Kundit-Kariah located to the north of Raniganj coalfield comprise the Deoghar group of coalfield.Coals of these coalfields are high volatile, non-coking to poorly coking sub-bituminous type.

Research Design

The representative samples were taken for the purpose of further investigation. The methods of sampling adopted are described here in two parts as follows,

a. Out crop samples.

b. Subsurface samples.

The following factors were taken into consideration in preparation of samples for analytical purposes-

a. Proper representative reduction from bulk field samples.

b. Prevention from contamination.

c. Protection of samples from chemical action and.

d. Proper choise for further examination.

The samples collected from the field were throughly washed with distilled water to remove dust or any superficial contamination. Thereafter, half of the samples were preserved as key samples and rest half were subjected to different analytical procedures.

Chemically, coal consists of a mixture of complex organic compounds along with small amount of inorganic mineral matter and moisture. The chemical composition of coal was determined by approximate analysis or by ultimate analysis.

The proximate analysis includes the study of the following:

a. Moisture content

b. Volatile matters content

c. Ash.

d. Fixed carbon and

e. Caloritic value.

The ashes of the sample analysed for proximate composition have been subjected to the determination of the major elements following usual rapid silicate analysed methods. The ashes of the samples collected from different places have been individually bulked together and analysed and again with each batch of the analysed and again with each batch of the analysed standards were run so that the accuracy and reproductively of the result may be checked.

Experiment and Results:

The study of coal is a highly specialized one and it is beyond the scope of the present investigation. The proximate analysis and chemical analysis of coal and ash content respectively have been carried out of the some selected samples of coals obtained from the abandoned coal mines.

The Gondwana Supergroup of rocks in the Jainti coalfield is represented by the Talchir, the Karharbari and the Barakar only In the northern shows natural boundaries from Karmatar Station Banskupi. The coal are generally fair to medium in quality, low grade and non-caking in nature. The proximate analysis suggest that they contain high properties of ash content and a little amount of moisture and volatile matters. Fixed carbon is subordinate to ash content. The present area of study a high percentage of ash up to 26.38 % low moisture content varying from 2.21 to 5.97 % and frequent occurrence are complete.

Qualitatively moisture and ash content of coal seam range from 2.2 to 4.2 % and 9.5 to 22.0 respectively. However the seams are thin and some what impersistent over major part of the coalfield area. The workable coal has been assessed. Shaharjuri coalfield contains coal-seam of Karharbari as well as Barakar Formation.

Karharbari Formation contains coal, Khaki coloured sandstones and shales. Barakar Formation contains coal light coloured friable sandstones and carbonaceous shale and clays. Coal seams are better developed coals are of non-coking type.

Kundit Kuriah coalfield is the smallest coalfield of the Deoghar group. It has three coal seams with in Karharbari Formation.

The coals are lenticular in deposition. They are not very persistent. In general, the moisture and ash content of the coal seams vary from 5.8 to 9% and 7.8 to 49. 6% respectively.

Conclusion

The study of coals suggests that Deoghar District contain.

1. High ash content.
2. Low moisture content.
3. There is frequent partings.
4. They were deposited in cold humid tropical climate condition under.
5. Fluvial and swampy environment.

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