

169. Environmental Impacts of Thar Coal Mining

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Abstract

In this unpredictable world, people are frequent of using new sources for living wage. Coal energy is the arising technique in today's world. Coal is the natural and cheap source of energy. Many countries generate electricity from coal. Besides the energy supplier, coal is the source of pollution also. Mining activities enforce some outer charges on neighboring regions. Few of them may easily be calculated and some are tedious to estimate. This paper put study on the impacts during mining activities and the causes that degrades the natural habitats, residents, also it disturbs atmosphere that causes the global warming. Releasing of the waste water vapors into the atmosphere causes acid rain. Dumping of overburden in the soil causes the infertile land. Waste water treatment, ash disposal, and air pollution are the main parameters of this paper to study on. If care were not taken, condition will be worsening in mining areas and energy will emerge as destruction for country.

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Keywords: Thar coal, Mining, surface, underground, environment, sulphur dioxide, nitrogen oxide

1. Introduction

Coal mining plays vital role on the growth of economic of the country though it puts big effect on environment and human health. Activities of mining keep great pressure on nearby ecosystem, especially where there mining is taking place. Ground water, sitting of land, blocking of water because of ash dump, ecosystem under water and the air pollution are affects by mining activities. Holistic techniques must be involved in mining activities which may not be effective for environment. This needs proper concern of overburden dumps, removal of waste drains techniques etc. In Pakistan Coal is located in Tharparkar, Sindh. Coal mining carried out of two methods - 'surface' and underground mining. In Pakistan, coal energy is privatized. At present, Engro is holding the 60% shares of the Thar coal and is interested to produce a power plant that generates more than 23,000 MW electricity. Company claims that Thar coal field has total lignite coal assets of 175 Billion tons that can produce 100,000 Megawatt (MW) for over 200 years. Final report was given on Thar coal block II [1]. Thar coal mining block I and block II are developed by SSRand SECMC and they claim that coming 10 years power projects will be set up by using lignite coal to produce 6000 MWs in Sindh, Pakistan. 1200 MWs each with a configuration of 2 x 600MW will be obtained in five phases claims the Engro. Electricity generates through different process. Ahmed, et al. (2013) put study on Thar Coal Block I [2]. Muhammad Imran and et al. (2014) investigated and concluded by the results that underground gasification is the best technology for health, safety and reducing the environmental impacts [3]. M. Makki investigated Religious variation in the development of coal mining in Tharparkar, Pakistan. Results gained from the study ends on various communities have different perceptions about the project whereas they entail a practical dimension that suggests that in the process of evaluation, growth and organising of coal support tools, religious and community distinctions must be recognized and consideration to minimize community conflict [7]. Assessment was done on six rural areas near the coal project by M. Makkiand et al. Investigation was done on the Thar lignite coal block VIII using pilot-scale combustion [8]. Coal is made up of clay stone, siltstone and layers varies thick in Block no. 1 tharcoal [6].

2. Source of data & methodology:

The present study is an observed research reviewed by different authors who worked on Tharcoal mine

field. The Thar coalfield run to the earth between Latitudes 24°15'N and 25°45'N and Longitudes 69° 45'E and 70° 45'E in the lower region of Sindh Province. For evaluation of coal resources four blocks are selected through earthy observational study of Tharparkar. The methodology of this study includes the compilation and comparison of research matter through study and observation.

Exhibit I: Location of Block II and Power Plant



3. Advanced technology used in Coal Mine.

Coal is not abandoned on surface but dummy results are seizing from core and borehole logs [5]. Thar coals are brownish black, greyish black, and black in colour, cleaved and solid [6]. In coal burning, hazardous degree of air pollution and water pollution is evident due to this mining harmfully disturbs environment. CFB boiler is used for analysis of gases and for collecting ash particles Stable method that removes dust particles by electricity is used [1]. Further, for cooling water, unconstrained turbines are used. All type of waste that evolving with mining activities is used for mine overburden. Geochemical and coal petrography methods are used in [2]. Results of Ahmed and et al. shows that Thar coal is source of gasification and liquefaction also it is environmental friendly if care is taken on the mining activities because of low ash and sulfur [2]. Underground Coal Gasification technology is used in [3]. Different gases releases under the mining activities that degrades the environment and the air quality does not match the standards of the health. Further, results manifest that this technology lowers the noise, water and soil pollution increase the coal content and lowers the organic elements that causes global warming [3]. Environment issues in Thar coal region due to coal mining activities are not very harsh in Pakistan as compare to other countries due to privatization of the Thar coal industries [4]. Due to proper action and methods applied on the mining activities, low environmental issues happen and expectation of production of energy is high in future. Daood and et al. has calculated different gases such as NO_x, CO and CO₂ at different fired places at numerical values 2, 2.3, and 2.6 in 4 meters long furnace. 18-20% of iron oxide were calculated during the test whereas 14-16% of alumina was measured [8].

4. HSE Aspects of Different Technologies

4.1. Emission of toxic gases and ash disposal in mine region

Coal burning discharges toxic gases like sulphur dioxide, nitrogen oxide, carbon dioxide, also particulates of dust. Environmental and health issues happen by ignition of natural gas, sulfur dioxide and nitrogen oxides releases and produces acid rain. By Underground coal gasification methods 25% less Greenhouse gases releases. CO₂ which is release by the UCG process is then carry through pipelines. All toxic gas emission is within the limits by the process UCG. Further ash content is very low on surface and reduces the risk of pollution in environment [3]. Normal range from 19.86 to 69.51 wt.% of organic carbon from coal has been obtained, whereas carbonaceous claystone has 2.33 to 5.82 wt.%. Normal range of Sulphur changes from 0.48 to 6% with an average less than 1%. Ash produces ranges from 3.24 to 8.46% [2]. 9.69 % of ash and >99% emission control method is used by Engro company [1].

4.2. Hazardous water facility

In the study reviewed no drainage lines were found in Thar region. Waste water that comes from the process of clean coal is used again. By the process the waste particles removed separately from water and water reuse into ground, this reduces the impact on the groundwater ecology [1]. Two aquifers are used in upper seam range 180-192ft depth of Thar coal block and one ranges 344-358 ft. So, no risk of water infection is found in project area [3]. Minimum water is used for gasification process than surface mining that lowers the hazardous evaporation in air and minimize air pollution [3].

5. Conclusion

In this paper, light is kept on the study on Thar coal environmental impacts. As coal is the energy source also releases hazardous waste that pollutes the environment. Research has been done by different researches and literature is given in this paper. Results of different authors shows the best techniques such as UCG, petrology and different instrument that are used for clean coal. In my opinion, the best technique used in Engro Thar coal project. Not only it minimize water and air pollution also it reduces soil pollution

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