

JHARIA COALFIELD FIRE CASE STUDY

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Abstract — Jharia Coalfield had been started Since at end of 19th century ,various private individuals initiated mining activities without having proper execution plan they just only extract coal from underground & left it without closing properly, as the time passes due to spontaneous heating coal seams catching fire the first fire detected in 1916 . the coalfield fire situated in eastern region of India located in Gondwana basin of Damodar Valley. At present there are 70 plus coal mines fires were detected and about 38 million tonnes of coal reserves had been exhausted due to burning of coal. Big organisation , Government of India were

together to identify the cause of fire and searched for mitigation plan , also implemented but the fire is unstoppable .

The Jharia coalfield situated in Jharkhand is a store house of coking coal in the country, it consists of 23 big underground and 9 large open cast mines. The mining activities in these coalfields commenced in 1894 and did really magnify in 1925. In 1916 the first coal mine fire was spotted in Jharia coalfield. At present, there are over 70 mine fires reported from this area. Currently the fire has become unstoppable, but

various initiatives have been taken to reduce intensity of burning.

The fire include noticeably harmful gases which include CO and carbon dioxide, methane (CH₄), nitrogen oxides(NO_x) and SO₂, and other particulate matter, reasons belowground explosions and land subsidence, opencast blasting in addition they make contributions to cancers, T.B, Asthama and other respiration diseases. This gases release into atmosphere which affect global mean temperature with rapid increase leading to global warming and climate change. Water table levels are decreasing continuously due to mining, the aquifers of fresh water get contaminated causing drinking water impure via increasing impurity. Coalfield of Jharia is a big coalfield located in the eastern region of India in Jharia, Jharkhand. Jharia Coalfield fire is demarcated between latitudes 23°38' N and 23°52' N and longitudes 86°08' E and 86°29' E extending 38 km from East to West and 19 km from North to South with an area of 450 Sq Km. The Coalfield of Jharia makes a part of the east-west Gondwana basins of the Damodar valley in northeastern region of India. As sub-surface fire is having drastic impact on soil, water, plant life, and air etc. in order to conquer those troubles, we need to prevent this sub-surface fire. Because of these fire the launched gases cause smog, acid rain, international warming inflicting GHGs.

Sustainable mining is the most environment friendly. Fire triangle has been taken into consideration when action against fire needed.

Methods used by government, BCCL that is transforming underground to opencast mine, Nitrogen flushing, blockage of ventilation, identifying and filling of cracks from surface to underground, Water spraying, Removal of mucking fire by excavator. Using advanced technology such as drone to scan and identify the fire prone area and also with help of A.I unmaned vehicle to rescue and mitigation of fire as well.

In Modern day technologies get advance with drone and sensor technique it is useful to inhibit the fire which is unmanned vehicle from these we can check real time monitoring of fire and also we can access the places where human can't go and perform operation as well.

By using drone technology we do water spraying on a larger scale and remove coal rock carrying fire.

The air quality of Jharia gets very poor by gasses, smokes and dust due to fire, mining operations, mining activities causes land degradation cutting and felling of trees which ultimately decreases carbon sinks and lead to climate change. The mining activities from decades, polluting water bodies and damaging soil creation of various water borne diseases and making soil infertile for agriculture due to dust,

fumes etc. This causes the unsustainable environment. There are fires generally due to natural process in the environment due to thunderstorm, lightning, bushfires, forest peat fires and surface fire which can be dangerous like a disaster if not properly given attention. Factors that are involved which is not natural due to man machinery operation such as mining machinery, sparks by welding, combustion, coal-fired power plants, mining hazards, smoking of cigarette near to mines, flammable gases such as methane and hydrogen are source of fire if they get ignition , burning debris near the mines leading to the fire.

At the end of 20th century fires in Jharia increased enormously making unable to control which is possibly unstoppable because the area of Jharia much larger which is impossible for company and government of India to handle. Jharia coalfield fire also due to illegal mining by mafias and political agents for short term profit they followed closure plan of coal mine . Government of India takes various initiative to rehabilitate the local tribe population and ensuring their safety security of life and this migration of locals disturbed the peoples sentiments attach to the their homeland . Company is trying to expand opencast mining to extract faster coal beneath of Jharia so destruction period will reduce modern day technology such as unmanned vehicle drone

, Robots with A.I technology are useful in detection of fire and rescue recovery of that fire prone region. In a view to whole case we found at conclusion to that the fire in jharia coalfield can be used as syngass by process of coal Gassification. The Coal Gassification helps to consume the coal seam and also convert into useful methane CH₄ gas this will benefit our economy and also need of thermal energy can be fulfill.

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