Impact of Coal Mining

India is one of the world's major coal producers, ranking third after China and US. As its economic growth relies heavily on mining and industries, India has adopted an aggressive policy of coal mining for the facilitation of coal-fired power generation regardless of the environmental and health consequences to coal workers and populations living around mines and power plants. India is also one of the top coal importing countries, ranking third after China and Japan. In 2013, India imported a total 180 Mt of hard coal.

A dangerous and hazardous operation, coal mining serves as a focal point for energy planners, health professionals and environmentalists. Coal, primarily used to produce electricity, is a fossil fuel mined for century's deep underground. The goal is to remove coal from the ground as economically expediently as is possible. The advent of explosives and heavy machinery has also made surface mining, particularly opencast mountain top coal removal, particularly cost-effective. A perusal of the environmental, social and health impacts of coal mining and combustion studies worldwide indicates that while the occupational health hazards of coal mining are well documented, few studies consider the public health consequences of coalmines and coal-fired power generation.

US-based study into the *Health Effects of Coal Electricity Generation in India* correlates data, however, on particulate and gaseous emissions from power plants across the country with available United States data on lung cancer and cardiopulmonary mortality due to long-term exposure to fine particulate air pollution. While this study helps ascertain the health consequences of coal-fired power plant particulate and gaseous emissions in India, we are not aware of any other study which investigates and collates samples of air, soil, stream sediments and water pollutants in communities living adjacent to opencast mines and coal-fired power plants in India while simultaneously exploring the potential health impacts of these pollutants on these identified populations.

The use of coal has a variety of adverse impacts on our environment and health. Every step in the generation of electricity by coal-fired thermal power plants – coal mining, transportation, washing at power plants, combustion, and disposal of post-combustion wastes

– carries serious risks to the health of miners, plant workers and populations living around the mines and power plants. Before it is transported to power plants, coal is usually washed with polymer chemicals and large quantities of water to separate soil and rock impurities from the fuel. Liquid waste, slurry or sludge which is a byproduct of this process is likely to contain heavy metals common to mined rock such as arsenic and mercury. The transportation of coal itself by rail or road produces toxic fumes including Nitrogen oxide and Particulate Matter in the form of diesel exhaust released into the air.

Depending on its variety and composition, coal burning releases over 70 harmful chemicals through Particulate Matters into the environment; typically they contain arsenic, cadmium, chromium, lead, manganese, mercury, nickel, silicon and oxides of sulphur, nitrogen and ozone.

Coal combustion produces and emits gaseous by-products into the atmosphere or solid wastein the form of coal ash. Pollutant Particulate Matters (PM) primarily containing PM2.5, Sulphur dioxide (SO2), Nitrogen oxides (NOx) and Ozone gaseous emissions and heavy metal solid waste, namely mercury, are of serious concern among environmentalists and public health specialists. While posing significant threats to the environment, such pollutants are linked to respiratory, cardiovascular and neurological health issues and cellular inflammation leading to cancer and a range of chronic health conditions.

'Coal's Assault on Human Health' 'Physicians for Social Responsibility' report elaborates the health effects of coal pollutants and highlights a higher prevalence of morbidity and mortality of respiratory, cardiovascular, neurological, heart and kidney diseases on a population at large, as well as negative environmental effects

Environmental Impacts of Coal Mining in India comprehensively examines the environmental, health and socio-economic impacts arising in the course of the life cycle of coal - impacts on land, water, air, wild life and ecology; impacts due to blasting, transport and storage; impacts on health and safety of workers and, on society, concludes that while coal will

remain a primary source of energy in India's economic growth and development, the consequences of coal-fired electricity on environment and health must not be ignored. India must adopt alternative strategies to meet its growing energy requirement.