International Journal of Engineering Research & Management Technology

ISSN: 2348-4039

January- February-2020 Volume-7, Issue-1

Email: editor@ijermt.org www.ijermt.org

# MINING AND ENVIRONMENTAL ISSUES AND CHALLENGES

**Dr. Suman Badola**

**Associate Professor , Department of Geography**

**Seth Ranglal Kothari Government P. G. College, Rajsamand, Rajasthan**

**Abstract-**

*Environmental issues are the harmful effects of human health. The major current environmental issues may include climate change, pollution, environmental degradation, and resource depletion. Many of the issues we faced in public health. The waste material is easy to throw something in a trash can. He more people there are on the planet, the more they release carbon dioxide and other gasses into the air. Biodiversity, or the variety of life in the world or a particular ecosystem, is declining. The levels of biodiversity across the board have significantly lowered to a dangerous amount.* This paper represents the assessment of environmental impacts of mining activity on environment such as soil erosion, ecological disruption, air and water pollution, and health etc. and National Mineral Policy2019.Therefore,management of a country's mineral resources must be closely associated with overall economic development, environmental protection & preservation strategies .Most countries t throughout the world require some form of environmental impact assessment(EIA)of major mining projects expected to have significant impact on the quality of the human environment, before such projects can be approved and undertaken.

**keywords**: *Environmental, Challenges, Mining*

## INTRODUCTION

Minerals are important parameter of the national economy of any country. India is fortunate with considerable mineral r esources. Maximum part of land is under mining - a substantial portion of which covered by forest areas. There are about 20000 known mineral deposits in India and as many as 89 minerals (4 fuel, 11 metallic, 52 non metallic and 22 minor minerals) are produced worth Rs. 73944.59 Crore. (Annual Report 2004–05, Ministry of Mines).Open cast mines as well as underground mines Both types of mines affected the environment .Open cast mining operations result in dumping of overburden on un mined area which is consolidated and unconsolidated materials overlying the minerals ,and is required to be removed. One of the major environmental challenges is to manage overburden generated in these open cast mines which is associated with the problems of loss of topsoil, soil erosion, water and air pollution, noise pollution ,loss of forest and biodiversity, ecological disruption, social problems, and health etc.

### Environmental Damages of Mining

### Open pit mining

One of the most popular methods used for mining strategic minerals is known as open pit mining. This type of mining involves excavating material from an open pit. This sort of mining is particularly harmful to the

environment since strategic minerals are frequently only present in small concentrations. As a result, a greater quantity of ore needs to be mined in order to obtain the desired amount of the mineral.

During each and every stage of the open-pit mining process, there is the potential for environmental damage. Mining in hard rock often reveals previously hidden rock that has been dormant for eons in geological terms. When these rocks are broken, radioactive elements, minerals that are similar to asbestos, and metallic dust are released. During the separation process, leftover rock slurries, which are combinations of crushed rock and liquid, are created as tailings. If the liquids are not properly controlled, hazardous and radioactive components can seep into the bedrock.

**Underground Mining**

According to Betournay (2011), the practice of underground mining carries with it the risk of cave-ins and land subsidence. It is quite similar to open pit mining in that it includes the relocation of enormous amounts of waste rock and vegetation. In addition, similar to the majority of other types of mining, underground mining can result in the release of hazardous substances into the surrounding air and water. It is possible for water to become contaminated when it accumulates sufficient levels of minerals and heavy metals that are hazardous to human health. According to Miranda, Blanco-Uribe Q., Hernandez, Ochoa G., and Yerena (1998), the mine's polluted water has the potential to harm the area surrounding the mine and even beyond. According to Miranda et al. (1998), amalgamating agents made with mercury are frequently employed to improve the efficiency of the mining process for some valuable ores. When this happens, the mercury tailings become a big cause for worry, and if they are not disposed of properly, it can lead to poisoning of the atmosphere and the bodies of water in the surrounding area. Blasting using hydraulic pumps destroys ecologically rich topsoil that contains seed banks, making it harder for plants to regenerate (Miranda et al., 1998). Most underground mining operations enhance sedimentation in neighboring rivers through the use of hydraulic pumps and suction dredges. Mining activities cause deforestation, which in turn contributes to the breakdown of ecological communities and exacerbates the consequences of erosion.

**In situ leach (ISL) mining**

The ore body is dissolved and then pumped out, leaving minimum surface disturbance and no tailings or waste rock (World Nuclear Association, 2012). This creates environmental and safety advantages for ISL mining over traditional mining. According to research conducted by the International Atomic Energy Agency (IAEA) in 2005, the mining technique requires significantly less water and does not expose the surrounding environment to mine dust or direct ore exposure. However, the powerful acids that are employed to dissolve the ore body also often dissolve the metals that are present in the host rock. According to the IAEA (2005), the fluids that are left behind after the leaching process typically include increased quantities of metals as well as radioactive isotopes, which poses a substantial danger to the local ground and surface water sources. In addition, the low pH of the wastewater produced by ISL mining might lead to the acidification of the ecosystem in the surrounding area.

**Heap Leaching**

The failure to keep process solutions contained inside the heap leaching circuit is the primary driver of environmental concerns associated with heap leaching. According to Reichardt (2008), the release of hazardous heap leaching fluids into the environment can have a negative impact on the health of the

surrounding ecosystem as well as the human population. The water balance is extremely important in heap leaching projects because there is a risk of an overflow of solutions containing dangerous concentrations of heavy metals following an intense rainstorm or quick snowmelt (Norman & Raforth, 1994). This risk can be mitigated by maintaining a stable water level. In certain instances, cyanide is used to extract metals from oxidized ores. The leach ponds that emerge from this process have been responsible for a substantial amount of wildlife mortality. According to Eisler (1991), around 7,613 animals perished in cyanide-extraction ponds in the states of California, Nevada, and Arizona between the years 1980 and 1989.

**Brine Mining**

When mining brine, one must first extract the brine solutions before evaporating them in order to eliminate any dangerous components and compounds before releasing the purified brine back into the environment. As a result of the high salinity content of the solutions to which well casings, pipelines, and storage tanks are exposed, these components are susceptible to corrosion, which can result in leaks and the contamination of bodies of water in the surrounding area (New York State Division of Mineral Resources, 1988). The drilling and transport of brine solutions can also have a negative impact on existing ecosystems. According to the Division of Mineral Resources (1988), there is currently no economically feasible method to clean up the pollution of an aquifer by sodium chloride. Harmful quantities of chloride impede plant development and can cause fish deaths.

**Impact on water**

a. A decrease in the amount of water that is available in the region as a result of mining's high water consumption

c. The draining of water bodies in the region for the purposes of quarrying and dumping.

c. A change in the normal drainage pattern.

d. Disruption of the hydrological and ground water regimes, as well as a lowering of the ground water table

e. The pollution of surface and ground water bodies as a result of the discharge of mine water, runoff from coal stocks and overburden dumps, particularly residential effluents, which renders water unsuitable for use in home settings and, in some circumstances, even for agricultural purposes.

f. Toxic or heavy metals may be produced as a result of acid mine drainage (AMD), which is caused by the presence of pyrite bands in coal seams.Toxic water can be caused by the contamination of heavy metals such as lead (in many mining belts of Chattisgarh and M.P.), mercury (across the India but coastal city like Mumbai, Kolkata,Karwar (in Karnataka), and North Koel(in Bihar)), uranium (in Rajasthan, Jharkhand, and Punjab), and other pollutants such as arsenic (in Bihar, Jharkhand, and West Bengal).

g. The surface water bodies will need to be drained if the subsidence movement on the surface exceeds the safe limit for such bodies of water.

h. Water from the underlying water bodies is pushed into the surface workings, which causes the underlying water bodies to be agitated.It is necessary for this water to be removed from the mine using a pump.

i. As cracks upto the surface form, surface rainwater eventually makes its way underground due to the development of cracks upto the surface. There is a possibility that this will bring with it a variety of toxins from the surface.

j. Polluted groundwater that is pumped to the surface and left there might contribute to the contamination of surface water bodies if it is not properly treated.

k. It is important to avoid dumping overburden from mines in valleys or depressed tracts on the side of mined areas since these areas are the primary source of water supply, whether it comes from surface or groundwater sources (Nriagu, 1988).This impact is evident in the Jamarkatra phosphorite mines as the construction of significant waste dumps in the southern valley, which is the location of shallow groundwater and surface water that is used for the provision of water supplies.

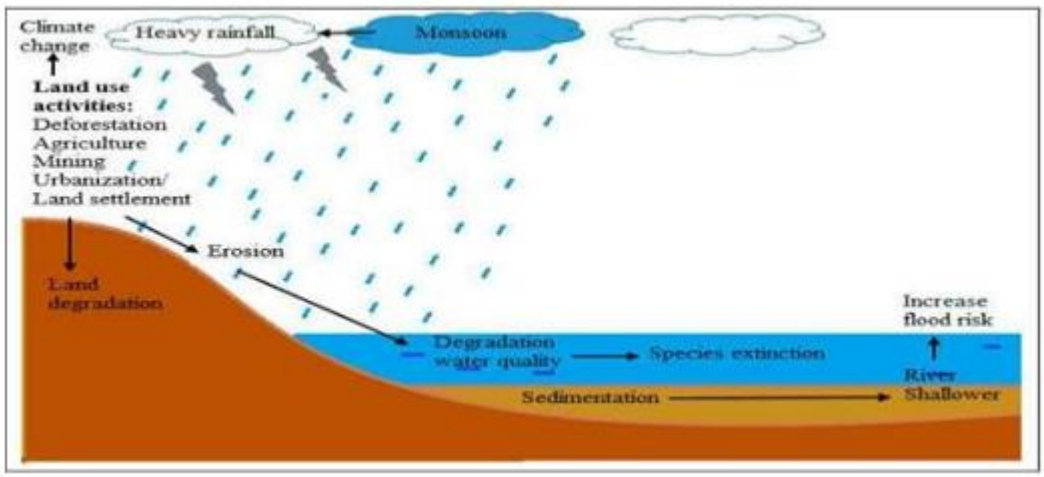


Fig. 2 The tic-tac-toe graphic illustrating how mining and other activities contribute to the deterioration of water quality.

Fig. 3The image that you see here originates from the Karnataka Lokayukta report from the year 2006.

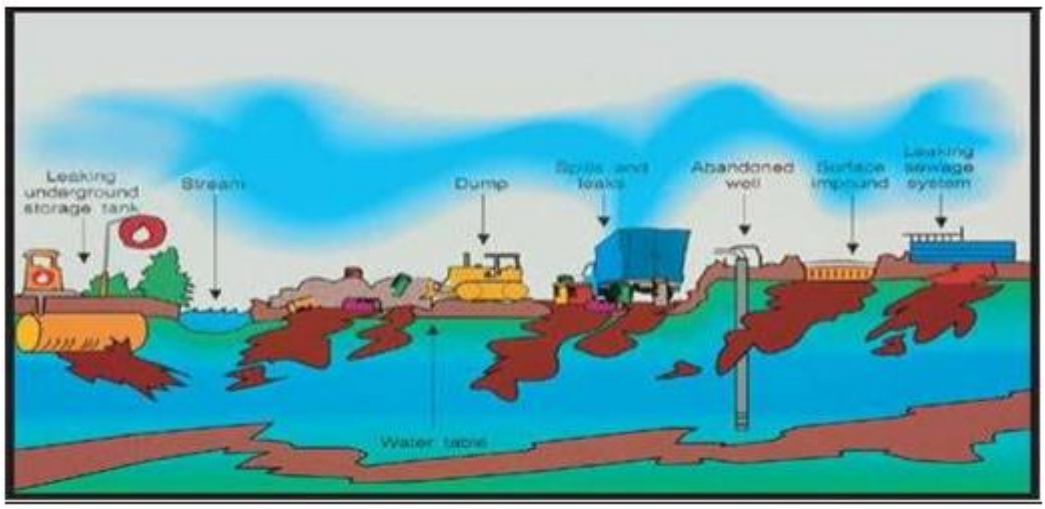


Fig.4The quality of both the surface and the subsurface water is shown to deteriorate as a result of mining activity.

**Challenges in Current Scenario**

Major current environmental challenges may include climate change, pollution, environmental degradation, and resource depletion etc. The conservation movement campaigns for the protection of ecologically valued natural areas, genetically modified foods, and endangered animals, as well as other issues related to global warming and genetic engineering.

**Point out some Environmental Challenges in the world.**

**Public Health**

A significant number of the challenges we encountered in terms of public health. There is a demonstrable risk to public health posed by factors such as overcrowding, pollution, and a lack of available water. According to the World Health Organization (WHO), hazardous surroundings are the direct cause of nearly one out of every four fatalities that occurs each year.

Even in affluent countries, a growing anti-vaccination movement poses a threat to public health by creating a recurrence in illnesses like measles that were nearly totally eradicated. This is because vaccinations prevent disease transmission. Monitoring the state of health and wellbeing of human beings should be a priority for you. A person's health can be significantly impacted by the food they consume, the liquids they drink, and the air they breathe. The ever-increasing problem of air and water pollution is one that requires our immediate attention.

**Waste Disposal**

It is quite simple to dispose of rubbish by throwing it away in a garbage container. The typical individual produces 4.6 pounds of garbage every single day, yet we do not normally give our local landfills much thought unless it is to complain about the odor they give off when we drive by them. Either it is disposed of in landfills or it makes its way into natural areas and the ocean. Disposal of waste poses a risk not only to the planet Earth and the ecology that it supports, but also to people.When trash is floating about in the water, animals that live

there may mistake it for food or become entangled in it. Burning garbage or radioactive waste releases dangerous pollutants into the air, which people then breathe in. These poisons can be harmful to human health.

**Over population**

The greater the population of the world, the greater the amount of carbon dioxide and other gases that are released into the atmosphere. The rising population comes at the expense of increased greenhouse gas emissions and accelerated global warming. People's actions will not change unless they comprehend the extent to which they are personally responsible for the urgent problems facing the environment. The population can not continue to exist without the resources it needs, yet those resources are not always obtained in a sustainable manner. We will have to keep our fingers crossed that we do not come to this realization too late.Thankfully, renewable energy sources offer an excellent approach to fight against the effects of carbon emissions. The necessary resources may be obtained in a manner that is environmentally friendly and responsible if there is an increase in the quantity of renewable energy sources such as wind power and solar power. This will result in a reduction in the amount of carbon emissions. You are unable to alter the population itself, but you do have control over what members of the population release into the environment.

**Loss of Biodiversity**

The variety of life that may be found in the globe as a whole or in a particular environment is becoming less and less. The overall levels of biodiversity have experienced a considerable decline, reaching a level that is considered to be hazardous. The World Wildlife Federation reports that there has been a 27 percent decrease in the amount of biodiversity over the past three decades. The state of the world's biodiversity is quite precarious as a result of a wide variety of challenges, the most prominent of which being urban development, deforestation, and climate change.The food chain, water supplies, and other resources are all put in jeopardy when there is insufficient biodiversity. Without sufficient levels of biodiversity, ecosystems degrade to the point that they cease to exist. The loss of biodiversity comes at a cost that the world just cannot afford to pay.Education and protection are the two most important things that can be done to stop the loss of biodiversity. Think in a way that is environmentally responsible. Make green choices. You should get the word out.

**Water Scarcity & Water Pollution**

Water that is intended for human consumption runs the risk of becoming tainted with pathogens, poisons, and other substances that are harmful to humans. There are around 780 million individuals who do not have access to any source of clean water. However, this is not only a concern in nations that are considered to be developing. The drought that occurred in California in 2017 and the fact that Flint, Michigan has not had clean water for over four years serve as the ideal example to demonstrate to us that water scarcity and pollution is not only an issue in other parts of the world; it is a problem right here in the United States as well. Your body, just like the Earth, is composed of a significant amount of water. To continue existing, both the earth and your body require pure water.

**Pollution**

There are many different manifestations of pollution. All three of these environments—air, soil, and water—have the potential to become contaminated. Both humans and the environment face a risk because of pollution, both now and in the future. The water has been contaminated, making it unsafe to drink. The ozone layer may

be damaged by polluted air, which also has negative effects on human health. Habitats and irrigation systems are both ruined when soil becomes contaminated.If pollution is present in the air that you breathe or the water that you drink, it has a significant impact on the body of a human being. Pollution places animals and the environment in a precarious state from which only humans are capable of rescuing them.

**Deforestation**

The emissions of greenhouse gases are not caused by automobiles or industry; rather, they are caused by the destruction of forests. There is a possibility that just 10 percent of the world's rainforests would still exist by the year 2030. The remaining rainforests have either been removed for agricultural purposes or logged for goods made from wood or wood pulp.

In addition to this, more than 70 percent of the plant and animal species that exist on the earth call forests their home. There is a loss of habitat for certain species. Ecosystems die out. Climate change continues. Fewer trees mean less oxygen and less carbon dioxide being removed from the atmosphere. Deforestation is to blame for everything. Lumber and land are the primary motivations for people to cut down trees, but if doing so means that there will eventually be no more woods, then none of these reasons are acceptable. People are not always aware of all of the unintended consequences of deforestation.

**Swachh Bharat Abhiyan**

The Swachh Bharat Abhiyan, also known as the Swachh Bharat Mission, is a program that is being run in India on a national scale from 2014 to 2019 with the objective of cleaning up the streets, roads, and infrastructure of India's urban regions, as well as its rural communities. Swachh Bharat Abhiyan is a campaign that was initiated by the government of India with the goal of educating its citizens about the significance of maintaining a clean environment.Therefore, the Swachh Bharat Abhiyan would not be possible without the contribution of this machine to the overall effort.

**National Green Tribunal(NGT)**

The National Green Tribunal Act, 2010 (NGT) is a piece of legislation passed by the Indian Parliament in 2010 that paves the way for the establishment of a unique court that would be responsible for the speedy resolution of legal disputes involving environmental concerns. It takes its cue from India's constitutional provision of Article 21, which guarantees its residents the right to live in a wholesome environment.

**WATER POLLUTION RULES AND REGULATION**

In 1974, the Water (Prevention and Control of Pollution) Act was passed into law in order to make provisions for the prevention and control of water pollution, as well as for the maintenance or restoration of the wholesomeness of water across the country. A number of changes were made to the Act in 1988. The Water (Prevention and Control of Pollution) legislation was passed into law in 1977 with the intention of facilitating the recovery and collection of charges on water utilized by those operating and carrying out specific sorts of industrial operations. The legislation was named after its primary purpose, which was to prevent and control pollution. The Water (Prevention and Control of Pollution) Act of 1974 requires the collection of this cess with the intention of boosting the financial resources available to the Central Board and the State Boards for

the Prevention and Control of Water Pollution. These boards were established in order to combat water pollution. The Act was most recently revised in the year 2003.

## MITIGATION MEASURE FOR CONTROLTHE IMPACT OF MINING ON ENVIRONMENT

The consumption of water in mining regions is fraught with peril. The operations associated with mining will invariably have an effect on the aquatic environment, whether that impact is caused by direct or indirect interaction with surface or groundwater. For this reason, businesses have a responsibility to make investments to either prevent the pollution of water or, in the event that contamination does take place, to purify the water or confine it inside suitable reservoirs, pipelines, canals, or other storage facilities. The mining industry as a whole has to do more to encourage the use of environmentally friendly practices and technology. The following is the standard procedure that all of the industries are required to adhere to:

- The conservation of resources and management of those resources in a scientific manner with a minimum amount of waste, as well as the discovery of alternatives for minerals that are now in widespread use.
- The responsible recycling of scrap metal. c. The implementation of technology that are less harmful to the environment.
- Making effective use of available energy.
- The operations of mining have a negative impact on the local population, putting their health at risk, putting their homes in jeopardy, and putting their means of subsistence, particularly farming, in jeopardy. It is the responsibility of the government at all levels to conduct an investigation into the actions taken by the operator as well as those taken by others in this region, to review and reevaluate their environmental impact assessment (EIA), to conduct activity appraisals on a regular basis and at regular intervals, and to ensure that proper compensation is provided effectively.
- Before a Quarrying License may be obtained from the government, it is strongly suggested that a comprehensive Environmental Impact Assessment be carried out beforehand. The government ought to establish a task force with the purpose of investigating quarry operators who are not adhering to the Code of Practice for Quarrying operations. Violators of the code ought to be brought to justice.
- The population, the government, and the operator firm of a proposed quarry site should all come to an agreement on a mode of operation. Settlers have to be moved and suitably paid in this scenario. During the process of issuing licenses and monitoring activities, the government need to do so with a level of objectivity that takes into account the interests of the residents. The government task force team need to include of members with expertise in geology, engineering, environmental studies, and surveying.
- Environmental control technologies
- using trash as a source of raw material. • reducing the quantity of waste created by re-engineering production processes.(Recycling of Effluents from Industrial Processes)
- reducing the amount of land that is required for mining and the activities linked with it by careful planning.
- The methodical removal, storage, and subsequent reuse of top soil on reclaimed ground as quickly as is practicable.
- Employing dust extractors in conjunction with drilling, crushing, and screening operations.
- Suppression of the blaze in the mine. o. Arrange the layout of the mine in such a way as to cause the least amount of disruption to the surface water bodies and the drainage pattern.

- Facilities such as roads, connecting roads, street lighting, wells, tube wells, hand pumps, schools, community halls, health centers, veterinary centers, retail center, panchayat bhawan, children park/play grounds, and tree plantation are to be provided at rehabitation sites.
- Restore or even improve the social and economic well being of the displaced people by treating Resettlement and Rehabilitation as an integrated component of mining, dedicating adequate manpower and financial resources, and treating Resettlement and Rehabilitation as an integral component of mining.
- Choose equipment that emits the least amount of noise possible. s. A significant decrease in both the level of noise and ground vibration caused by the mining of coal using surface miners.
- The use of properly designed blasting and regulated blasting in order to reduce the amount of ground vibrations.

## CONCLUSION

Mining practices caused serious environmental impacts related to water pollution, land degradation, loss of biodiversity, air pollution, increase in health-related problems, noise pollution, vibration, and subsidence and landslides. Surface and groundwater pollution is one of the significant impacts of mining activity. Mining practices caused serious environmental impacts related to water pollution, land degradation, loss of biodiversity, air pollution, increase in health-related problems. The government need to make it a priority to offer local players in the mining industry technical assistance in the form of training in facilitation and managerial tasks, for example. Mine waste should be regulated and converted into a form that is not toxic before it is released into waste ponds, and new equipment has to be developed that processes extracted materials with fewer chemicals throughout the extraction and processing stages. In order to get a mine license, it need to be essential for all mining activities, regardless of how large or little they are, to present a report that accurately assesses the environmental effect of their operations. The legislation known as "The Environmental Protection Act,1986" ought to be applied stringently to the whole mining industry, and the government ought to establish inspection officers to determine whether or not mine owners are complying with the legislation. To begin, it is imperative that the National Mineral Policy, 2019, be properly followed by all of the many stakeholders in the community.

## REFERENCES

[1] Annual Report.2004-05&2018-19.MinistryofMines,Govt.ofIndia.
[2] Nriagu, J.O and Pacyna J.M. 1988. Quantitative assessment of worldwide contamination of air, water and soils by trace metals. Nature. 333: 134-139.
[3] Agarwal.S.K, 2005, Noise Pollution, ABH Publishing Corporation, New Delhi-002
[4] Trivedi .R.N,2001, AtextbookofEnvironmental Science, Anmol Publishers, New Delhi.
[5] Rekha Ghosh, Chatterjee,2004, Environmental Geology- ecosystem protection in mining areas, Capital Publishing Company, 7/28, Mahaveer Street, Ansari Road, Daryganj, New Delhi-0001.
[6] Campaigs;Kudremukhbetrayed:TheKIDCL,MiningSaga,Karnataka,August.2000.
[7] The Environment(Protection)Act,1986,Ministry of Environment & Forests.
[8] National Mineral Policy2019
[9] Pullaiah. T, 2006, Biodiversity in India, Vol-IV Regency Publication, New Delhi
[10] Environmental law in india by vinay vaish
**[11]** L.c.kaku,2016,Mine management,legislation and genral safety

[12] Eccleston, Charles H. (2010). *Global Environmental Policy: Concepts, Principles, and Practice*. Chapter 7. ISBN 978-1439847664.

[13] *"Climate Change - Humanitarian Impact". Archived from the original on 2016-04-04. Retrieved 29 June 2017.*

[14] *"Climate Change - Threats and Solutions". Archived from the original on 2016-04-07. Retrieved 29 June 2017.*