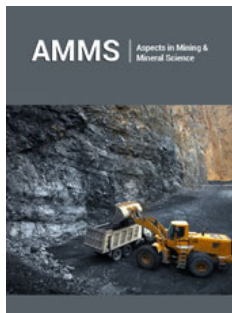


# Mining for a Sustainable World: The Adoption of Sustainable Blasting Techniques

**Yewuhalashet Fissha\*, Kursat kilic, Baterdene Bibish and Bilguun Enkhbold**

Department of Geosciences, Geotechnology and Materials Engineering for Resources, Graduate School of International Resource Sciences, Akita University, Japan

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**\*Corresponding author:** Yewuhalashet Fissha, Department of Geosciences, Geotechnology and Materials Engineering for Resources, Graduate School of International Resource Sciences, Akita University, Akita 010-8502, Japan

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## Opinion

The mining sector is crucial to the functioning of the world today. Mining has a significant role in modern civilization, as it is important for the extraction of minerals and materials used in construction and manufacturing, as well as the creation of jobs and economic progress. The environment and local inhabitants are also significantly impacted by mining activities. We need to consider the benefits and risks of mining to find a balance that lets us keep using the resources we rely upon without endangering the earth or its life. Blasting is a common method used in mining operations to extract minerals and resources from the earth (Figure 1). However, the impact of blasting on the environment can be significant. The vibrations and noise caused by blasting can damage buildings and infrastructure and can also harm wildlife and disrupt the natural ecosystem. Additionally, the dust and debris created by blasting can also cause air and water pollution, which can have a negative impact on the health of nearby communities. Furthermore, the fragmentation of rock caused by blasting can also lead to soil erosion, landslides, and other forms of land degradation. It's important for mining companies to take appropriate measures to mitigate the environmental impact of blasting, such as implementing dust suppression and vibration monitoring systems, and carefully planning and executing the blasting operations to minimize the impact on the environment and the nearby communities.



**Figure 1:** Mine blasting.

To tackle the environmental challenge of blasting in mining and to create a sustainable environment, the concept of “sustainable mining” is fundamental. Sustainable mining is a concept that is gaining increasing attention in the modern world. It involves practices that minimize the environmental impact of mining operations and promote the well-being of local communities. This includes methods such as using renewable energy sources, implementing reforestation programs, and implementing sustainable water management practices. By implementing these strategies, mining companies can help to protect the environment and the local communities in which they operate. One of the main advantages of sustainable mining includes reducing greenhouse gas emissions, protecting wildlife and natural habitats, and reducing water pollution. Sustainable blasting techniques in mining are essential to minimizing the environmental impact of mining operations. One basic technique is the use of precision blasting, which involves careful planning and executing the blasting process to minimize the amount of rock fragmentation, dust, and

debris created. This can help to reduce the impact of blasting on the environment and nearby communities by limiting the amount of air and water pollution, as well as the damage caused to buildings and infrastructure. Additionally, precision blasting can also help to reduce the amount of energy required for mining operations, which can help to reduce greenhouse gas emissions. Another basic sustainable blasting technique is the use of non-toxic and less harmful explosives. These explosives are formulated to be less harmful to the environment and human health. For example, the use of emulsion explosives instead of ANFO (Ammonium Nitrate Fuel Oil) can reduce the amount of nitrogen oxide and other harmful pollutants released into the atmosphere during blasting. Additionally, the use of electronic detonators instead of traditional blasting caps can reduce the amount of noise and vibration created during blasting. By implementing these sustainable blasting techniques, mining companies can help to minimize the impact of blasting on the environment and nearby communities while still being able to extract the minerals and resources they need.