

Ciencia Latina Revista Científica Multidisciplinar, Ciudad de México, México.
ISSN 2707-2207 / ISSN 2707-2215 (en línea), enero-febrero 2025,
Volumen 9, Número 1.

https://doi.org/10.37811/cl_rcm.v9i1

MINING IN PERU AND COLOMBIA: CHALLENGES, IMPACTS AND OPPORTUNITIES FOR SUSTAINABLE DEVELOPMENT

**MINERÍA EN PERÚ Y COLOMBIA: RETOS, IMPACTOS Y
OPORTUNIDADES PARA UN DESARROLLO SOSTENIBLE**

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DOI: https://doi.org/10.37811/cl_rcm.v9i1.16419

Mining in Peru and Colombia: Challenges, Impacts and Opportunities for Sustainable Development

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ABSTRACT

Introduction: The purpose of this article is to know the different aspects of the mining sector of Peru vs. Colombia in everything that concerns labor protection and well-being. Mining makes up one of the most significant economic areas in Latin America, including Peru and Colombia, however, this high-risk activity requires rigorous standards in relation to health and care in the workplace, since this trade is characterized by being one of the most dangerous and with the greatest possibility of health risk for those who carry out this activity. The purpose of this analysis is to find out how safe the working conditions faced by these workers are, what regulations they are governed by or whether they are implementing measures to protect workers, in order to control the different dangers that this activity leaves behind. **Objective:** The main objective is to examine the current environment in terms of labor protection and physical and mental well-being, considering past experiences and current regulations of the results in the mining industry, comparing the progress and strategies implemented to guarantee safe working conditions. **Methodology:** This section is based on an exploration of documents from secondary sources, including official reports, laws, regulations, government reports, regulations, as well as academic studies on health and defense in the work environment in mining in Colombia and Peru, to achieve greater knowledge about this information in this sector. **Results:** It can be established that in the extractive mining sector in Peru and Colombia they face a chain of complications in terms of labor protection, this includes high rates of illnesses and incidents, although in Peru this has decreased; Also, in these two countries they have legal regulations to handle everything related to the protection of workers that help promote safe working conditions.

Keywords: mining sector, safety, health, safe conditions, work

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Minería en Perú y Colombia: Retos, Impactos y Oportunidades para un Desarrollo Sostenible

RESUMEN

Introducción: En este presente artículo tiene como finalidad conocer los diferentes aspectos del sector minero de Perú vs Colombia en todo lo que concierna con la protección y el bienestar laboral. La minería compone una de las áreas económicas importantes más significativas en América latina, entre ellos Perú y Colombia, sin embargo, esta actividad de alto riesgo requiere rigurosos estándares en relación con la salud y cuidado en el lugar de trabajo, ya que este oficio se caracteriza por ser uno de los más peligrosos y con mayor posibilidad de riesgo para la salud para los que realizan esta actividad. Este análisis tiene como finalidad conocer sobre qué tan seguros se encuentran las condiciones de trabajo que enfrentan estos obreros, con que normativa se rigen o si están implementando medidas para la protección de los trabajadores, esto con el fin de controlar los diferentes peligros que deja esta actividad. **Objetivo:** El objetivo principal es examinar el ambiente actual en materia de protección laboral y bienestar físico y mental, considerando experiencias pasadas y normativa vigente de los resultados en la industria minera, comparando los progresos y las estrategias implementadas para garantizar condiciones laborales seguras. **Metodología:** Este apartado se basa en una exploración de documentos de fuentes secundarias, incluyendo informes oficiales, leyes, regulaciones, informes gubernamentales, normatividad, así como estudios académicos sobre la salud y defensa en el entorno laboral en la minería en Colombia y Perú, esto con el fin para lograr un mayor conocimiento sobre esta información en este sector. **Resultados:** Se puede establecer que en el sector minero extractivo en Perú y Colombia se enfrentan a una cadena de complicaciones en términos de protección laboral esto incluye altas tasas de enfermedades e incidentes, aunque en Perú esto ha disminuido; también en estos dos países cuentan con una normatividad legal para manejar todo lo relacionado con la protección a los trabajadores que ayudan a promover las condiciones de trabajo seguro.

Palabras Claves: sector minero, seguridad, salud, condiciones seguras, trabajo

Artículo recibido 12 enero 2025

Aceptado para publicación: 15 febrero 2025



INTRODUCTION

This article seeks to understand the issues covered by the labor safety guarantees, in this case it will be the mining sector since this constitutes a vital item in the economic field very important in several Latin American countries, such as Peru and Colombia, this sector became in Peru one of the most important with an equivalent to 11.7% of the economy of this country. Both countries have important mineral deposits that contribute significantly to their national economies, generating employment, tax revenues and attracting foreign investment. However; In Colombia in the first four months of the year 2024 mining exports represented 24.99% in the whole territory; The mining sector helps these countries to reduce poverty rates, in addition to the great importance of this activity is that it also brings serious challenges related to the protection and health at work because the scenarios where they perform the functions with which workers encounter are dangerous to the health of each of them.

In the mining sector, workers face working conditions that contain exposure to hazardous materials, risks of fatal accidents and occupational illnesses, and long working hours in hostile environments. Despite efforts by some companies to mitigate these risks, gaps in the implementation of preventive measures and effective supervision remain a critical problem. In Peru, from January to September 2024, there were fourteen (14) fatalities, eight (8) were classified as caused by rock falls, four (4) by entrapment or impacts caused by moving mechanical equipment, one (1) by collisions or damage caused by objects while handling loads, and one (1) by collisions against or trapped in or impacts by motor vehicles; While in Colombia in the year 2023 it was known that fifty six (56) miners lost their lives after a strong explosion in a coal mine, as corroborated by the person in charge of Occupational Risk Prevention of the Ministry of Employment, Carolina Galindo.

In this context, all these companies are governed by the regulations in force both in Colombia and Peru, implementing the procedures required by the government in everything associated with the welfare of employees whose objective is always to take care of the health of the worker, establishing the minimum requirements demanded by law, strengthening the protection of mine workers and promoting a safer and sustainable mining.



Background

Law 1562 of 2012 transformed the protection regime against occupational accidents in Colombia, including specific provisions in high-risk sectors such as mining. The intervention, Supervision and monitoring of the Ministry of Labor in the Occupational Safety and Health Management System in the mining sector aims to verify compliance with the regulations of the General System of Occupational Risks.

Decree No. 539 of April 8, 2022 Whereby the Health and Safety Regulations for Open Pit Mining Works are issued, establishing essential guidelines to mitigate occupational risks in open pit mining works and establishing provisions to guarantee the safe working environment where such works are carried out.

Resolution 0312 of 2019 institutes the fundamental specifications of the Comprehensive Occupational Safety and Health Management System, applicable to all companies, including mining companies. The present Minimum Standards belong to the group of guidelines and necessary conditions of mandatory compliance procedures for employers and contractors that allow establishing, examining and monitoring the basic technical-administrative conditions, as well as financial conditions indispensable for the effective implementation and continuous development within the Comprehensive Occupational Safety Management System.

The National Mining Agency (ANM) is responsible for reviewing and promoting the defense of the mining sector, as well as preparing workers in safe skills. The ANM has implemented mine rescue programs and has established emergency brigades in mining regions.

Law No. 29783, the legal framework on Worker Protection and its regulatory provisions constitute the fundamental regulatory structure for all labor activities, including mining. This statute institutes the fundamental guidelines to ensure occupational safety and physical and mental well-being in the workplace were published on August 20, 2011 and officially implemented from the 18th of the following month until the following year. These standards are mandatory for all Peruvian companies regardless of size or industrial type.

Likewise, it is mandatory for all companies to have a comprehensive system for managing physical and mental well-being in the workplace adapted to their particular needs. Consequently, this system must



incorporate defensive strategies to minimize occupational risks, as well as an orderly set to manage critical situations in the company.

Supreme Decree N° 024-2016-EM specifically regulates on professional physical and mental well-being within the mining field, detailing requirements for risk management and protection of workers. Its purpose is to communicate the occurrence of unforeseen events, dangerous events, occupational accidents and occupational diseases, thus promoting a culture of occupational risk prevention in the mining sector. All this goes hand in hand with the collaboration of the workers and the government, who will oversee its promotion, propagation and performance. The current Statute institutes the elements to avoid hazards at work, ensuring that those responsible for mining operations and employees can create safeguard systems that improve the stipulations of the current regulations.

METHODOLOGY

This document is based on a study of documents from secondary sources, including official reports, laws, regulations, governmental reports, norms, as well as academic studies on safety at work in mining in Peru and Colombia, in order to achieve a better understanding of this information in this sector. In this exhaustive research, different official government pages of each country, sources, academic Google, Scielo, university repositories, among other reliable pages were reviewed. For this purpose, some strategic words were selected such as: Safety, health, labor, mining, occupational health, mining sector, these keywords were of utmost importance for the search of information. In order to make this research more effective, the search was conducted in English. In this way, the incorporation of all relevant information on the subject was sought to ensure clearer information.

RESULTS AND DISCUSSION

In these countries, the mining sector faces significant occupational risks, such as high rates of occupational diseases and accidents, however, there are differences in each of them, in Peru serious occupational accidents have been reduced in recent years due to the increased implementation of regulations and preventive measures. Between January and September 2024, 14 lethal accidents were reported, with falling rocks being the main cause of this event. In Colombia in the year 2023, a tragic event occurred which was the detonation of a coal mine causing 56 deaths, in this event highlights the need for a more rigorous inspection in high-risk activities; In occupational diseases that are very easily



found in this sector are respiratory diseases such as pneumoconiosis, associated with prolonged exposure to coal dust, workers can also suffer from diseases such as silicosis which is associated with exposure to silica in all its parts, as well as malignant mesothelioma disease, due to exposure to asbestos. All these occupational diseases are the ones that are compromising the welfare of employees in this industry both in Colombia and Peru.

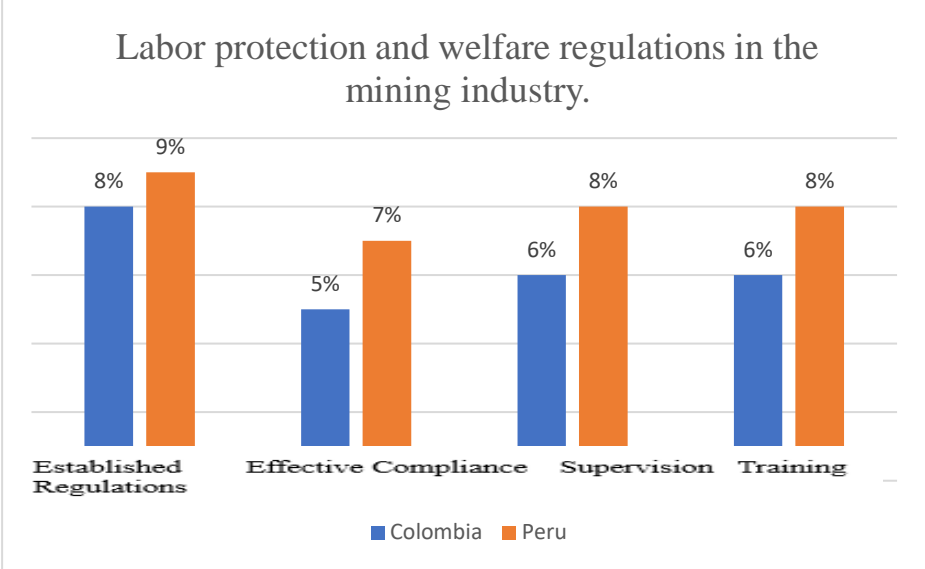
In the regulatory framework in both Colombia and Peru there are specific measures and statutes that help promote safety and health in the mining sector. In Colombia there is resolution 0312 of 2019, which establishes minimum standards in occupational safety and health management. In addition, the national mining agency plays a fundamental role in the control and training of this sector; In Peru, the law that regulates the mining sector is Law No. 29783 and Supreme Decree No. 024-2016-EM, which provide guidance for the prevention of occupational risks through safety programs appropriate to the needs of the workplace. Both countries have specific regulations, but enforcement and compliance seem to be more effective in Peru, which could explain the trend in the decrease of accidents.

Training and prevention programs in Peru have proven to have beneficial consequences in reducing accident rates. However, challenges remain regarding effective enforcement in some remote regions. In Colombia, although progress has been made in the creation of norms, there is still a significant gap in the study of these laws, especially in the case of illegal mining with its small operations.

The mining sector as an economic activity is decisive in both countries because it presents similar challenges in terms of occupational safety and health; on the other hand, the differences in the results show different degrees of implementation and effectiveness of official policies. In Peru, the orientation towards active worker intervention has recognized a stronger culture of prevention. However, the high level of formality in mining operations facilitates this implementation. In contrast, in Colombia, the informal sector, together with less consistent inspection practices and laws, represents a major challenge. This sector causes the economic and social impact of both countries to depend too much economically on mining and this helps them to improve working conditions in a sector that is high risk for workers, investing in technology, controls and engineering programs. Safety training is critical not only to protect workers but also to ensure the sustainability of this sector. Greater investment in these practices is important to minimize risks.



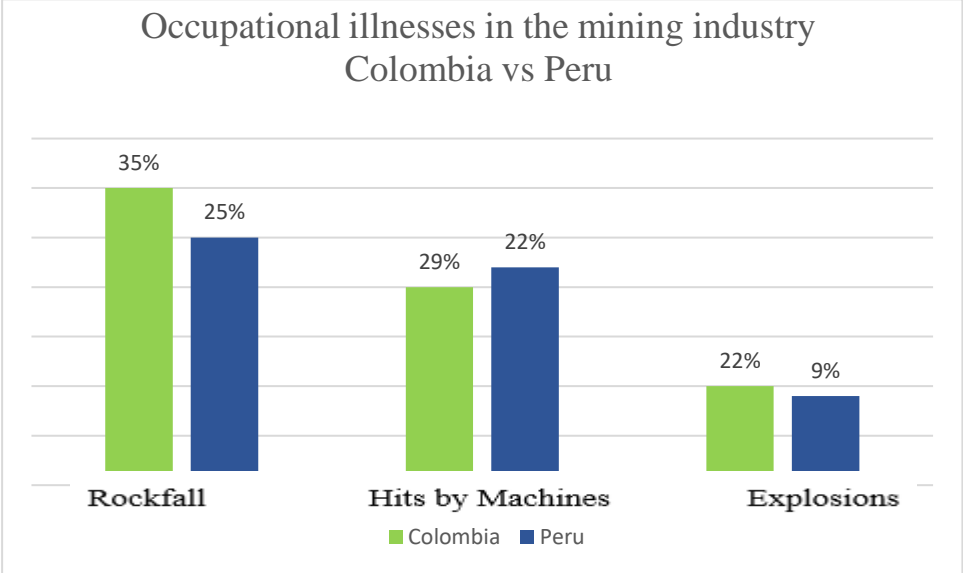
Figure 1. Labor protection and welfare regulations in Colombia vs. Peru in the mining industry



Fountain: Pabon,H. (2025)

As can be seen in the previous graph, it is determined that in the established regulations Peru has 9% and Colombia 8%, in effective compliance Peru has 7% and Colombia 5%, in supervision Peru has 8% and Colombia 6% and finally in training Peru has 8% and Colombia 6%, looking at these percentages, Peru in the regulations and compliance is 32% higher in this mining sector than the country of Colombia..

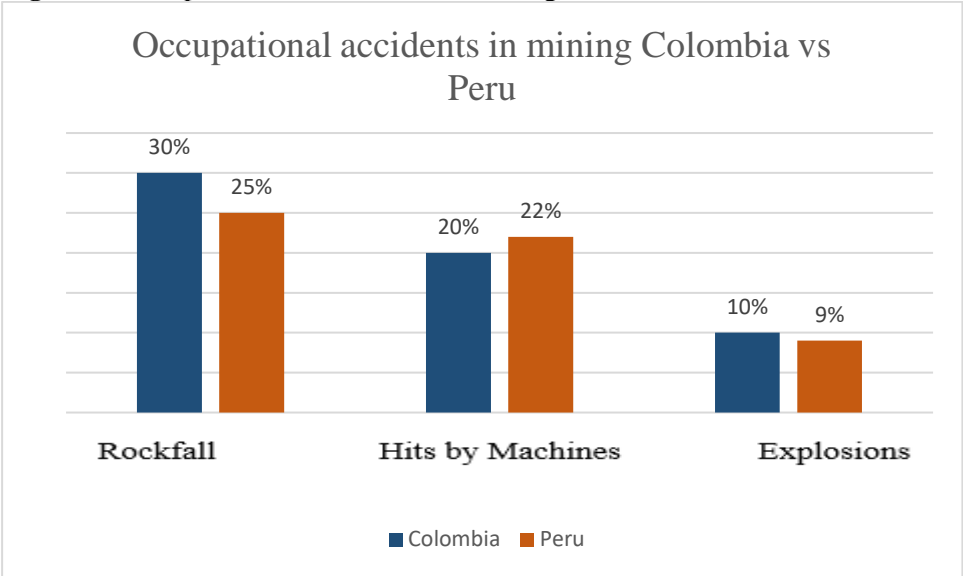
Figure 2. Most significant occupational illnesses in the mining industry



Fountain: Pabon,H. (2025)

The above graph shows that in Colombia occupational diseases in the mining sector are more significant than in Peru, with pneumoconiosis accounting for 35% more than the rest of the diseases.

Figure 3. Occupational accidents in the mining sector



Fountain: Pabon,H. (2025)

The previous graph shows that there is a similarity in both countries in terms of occupational accidents in the mining sector, with rock falls being the most significant in Colombia with 30%, in Peru, entrapment or blows by machinery has a percentage of 22%, which is a little higher than in Colombia with 20%, and finally, in Colombia, explosions have 10%, while in Peru they are somewhat similar, with 9% in this sector.

CONCLUSIONS

Peru has managed to reduce the number of serious occupational accidents in mining thanks to better implementation of regulations and preventive measures. In contrast, Colombia continues to face significant challenges in enforcing these regulations, especially in the informal sector.

The mining sector in both countries has hazardous working conditions, with high exposure to occupational diseases such as pneumoconiosis and silicosis, as well as fatal accidents such as explosions. However, both Peru and Colombia have occupational health and safety regulations, and supervision and performance are more effective in Peru, which has led to a decrease in occupational accidents compared to Colombia.



Mining is a key sector of the economy in both countries, as it contributes significantly to GDP and generates employment. However, the economic dependence on this sector makes it necessary to optimize labor and protection scenarios to ensure its sustainability.

Although both countries have made progress in regulating the mining sector, there is a need to strengthen worker supervision and training to reduce occupational accidents and illnesses. In particular, financing in terms of labor protection and welfare is important to certify safer and more sustainable mining.

In Colombia, illegal mining represents an additional challenge in terms of safety, as it often does not comply with minimum worker protection schemes.

It was established that Peru is stronger than Colombia in protecting workers in the mining sector in the area of occupational health and safety, with low percentages of occupational diseases and accidents, due to its stricter regulations in this sector.

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