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OCCUPATIONAL PROTECTION IN OIL EXPLOITATION: A COMPARATIVE LOOK ON COLOMBIA AND ECUADOR

**PROTECCIÓN OCUPACIONAL EN LA EXPLOTACIÓN
PETROLERA: UNA MIRADA COMPARATIVA SOBRE
COLOMBIA Y ECUADOR**

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Occupational protection in oil exploitation: a comparative look on Colombia and Ecuador

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ABSTRACT

The main objective of this research is to conduct an in-depth review of the fundamental aspects that guarantee occupational health in the oil industries of Colombia and Ecuador. Both countries have seen significant growth in this sector, which has significantly contributed to the development of their economies and the reduction of poverty rates. In this context, the study will focus on a systematic analysis of the legal regulations, national laws, and international conventions that govern occupational safety within this industry. Additionally, it will examine the strategies and measures adopted to protect both the physical integrity and emotional well-being of workers, as well as the main challenges they face on a daily basis. Specific objective: The central objective is to identify the guidelines established by each country regarding occupational safety, in order to understand how healthy work environments are fostered through policies aimed at comprehensive worker care. Ultimately, it seeks to recognize how these standards and actions contribute to the creation of safe and responsible work environments throughout the oil sector's production chain. Methodology: To achieve these objectives, a methodology based on a bibliographic review will be used, with a rigorous and systematic approach. Reliable documentary sources published in the last five years will be consulted, using relevant keywords in both Spanish and other languages. This will provide a broad, up-to-date, and international perspective on the topic. Expected results: It is expected to identify that both Colombia and Ecuador have robust legal frameworks that support safety and health in the workplace in the oil industry. These regulations not only establish clear responsibilities for employers and workers but also reflect an institutional commitment to creating safe, healthy, and humane working conditions. As companies regulated by the State, they are required to comply with these legal frameworks, thus contributing to the overall well-being of their employees.

Keywords: oil industry, safety, labor, well-being, occupational safety

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Protección ocupacional en la explotación petrolera: una mirada comparativa sobre Colombia y Ecuador

RESUMEN

El Objetivo principal de la investigación tiene como propósito realizar una revisión profunda sobre los aspectos fundamentales que garantizan la salud laboral en la industria petrolera de Colombia y Ecuador. Ambos países han visto un crecimiento importante en este sector, lo que ha contribuido significativamente al desarrollo de sus economías y a la disminución de los índices de pobreza. En este contexto, el estudio se enfocará en analizar de manera sistemática las normativas legales, leyes nacionales y convenios internacionales que regulan la seguridad en el trabajo dentro de esta industria. Además, se examinarán las estrategias y medidas adoptadas para proteger tanto la integridad física como el bienestar emocional de los trabajadores, así como los principales desafíos a los que se enfrentan en su día a día. Objetivo específico: El objetivo central es identificar los lineamientos establecidos por cada país en materia de seguridad ocupacional, con el fin de comprender cómo se fomentan ambientes laborales saludables a través de políticas orientadas al cuidado integral del trabajador. En definitiva, se busca reconocer cómo estas normas y acciones contribuyen a la creación de entornos laborales seguros y responsables en toda la cadena productiva del sector petrolero. Metodología: Para alcanzar estos objetivos, se empleará una metodología basada en la revisión bibliográfica, con un enfoque riguroso y sistemático. Se consultarán fuentes documentales confiables publicadas en los últimos cinco años, utilizando palabras clave relevantes tanto en español como en otros idiomas. Esto permitirá obtener una perspectiva amplia, actualizada y con enfoque internacional sobre el tema. Resultados esperados: Se espera identificar que tanto Colombia como Ecuador cuentan con marcos legales robustos que respaldan la seguridad y salud en el entorno laboral de la industria petrolera. Estas normativas no solo establecen responsabilidades claras para empleadores y trabajadores, sino que también reflejan un compromiso institucional con la creación de condiciones laborales seguras, saludables y respetuosas del ser humano. Al tratarse de empresas reguladas por el Estado, están obligadas a cumplir con estos marcos legales, contribuyendo así al bienestar integral de sus colaboradores.

Palabras clave: petrolera, seguridad, laboral, bienestar, seguridad, sector petrolero

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INTRODUCTION

This documentary research seeks to analyze the key factors that promote occupational wellbeing and the creation of healthy work environments within the oil sector, an industry of great economic and social impact in both Colombia and Ecuador. Through a comparative exercise between the two countries, the aim is to examine how occupational safety issues are addressed and what actions have been implemented to protect the health of workers. To this end, laws, decrees, norms, agreements and other related regulations will be reviewed in order to understand how these measures are applied in practice within such a demanding and strategic industry. In the case of Colombia, the oil sector represents one of the main sources of income for the country and is an important driver of employment generation. Beyond the economic figures, this industry offers direct and indirect job opportunities to more than 200,000 Colombian families. Companies operating in this field must abide by a series of local regulations aimed precisely at protecting the health and well-being of their workers. Ecuador, for its part, also depends to a large extent on the oil industry, which is an important pillar of its Gross Domestic Product (GDP). Although data are not fully comparable with those of Colombia, it is recognized that both countries face similar challenges in terms of occupational safety, due to the risks inherent in the extraction and processing of crude oil. The International Labor Organization (ILO) has been a key player in promoting a strong occupational safety culture in Latin America. Within this framework, it is essential that both Colombia and Ecuador strengthen their alliances between governments, employers and workers to build safer, healthier and more collaborative work environments, where the responsibility for well-being is shared by all the actors involved.

Key words: oil company, safety, labor, welfare, safety, security, oil sector



BACKGROUND

Since its inception, the International Labor Organization (ILO) has actively promoted the adoption of regulations to protect the health and safety of workers in the workplace. In Ecuador, this protection is based on a set of regulations designed to safeguard both the physical and emotional well-being of those who work in different sectors, including the oil industry.

One of the pillars of these regulations is the Workplace Safety and Health Regulations, approved by Executive Decree No. 255 on May 2, 2024. This document establishes the basis for promoting a culture of risk prevention in the work environment. It clearly defines who is responsible for ensuring safety within organizations and details their functions, depending on the size of the company and the level of risk. It also guarantees free access to health and safety training programs for all workers in the country.

Complementing this framework, Ministerial Agreement No. MDT-2024-196, issued on October 9, 2024, specifies obligations for both employers and employees. The agreement establishes 35 responsibilities that employers must fulfill, including: applying current regulations, identifying and managing risks, providing training, monitoring working conditions, and keeping up-to-date records. For their part, workers have 13 duties, such as following safety instructions and actively participating in the training offered.

On the other hand, Ministerial Agreement No. 1404 regulates corporate medical services, with the aim of taking comprehensive care of employees' health. This agreement obliges companies, both public and private, to offer adequate medical care to their workers and to implement strategies that reduce risks and improve well-being at work.

The Ecuadorian Labor Code also contemplates aspects related to occupational health, although no detailed information was found that would allow a point-by-point comparison with the Colombian code. Even so, it is reasonable to assume that it contains provisions aimed at guaranteeing worker protection and employer responsibility in occupational health matters.

In the case of Colombia, research such as the Strategic Proposal for Ecopetrol S.A. has evaluated how companies in the oil sector apply the minimum standards established in the Occupational Safety and Health Management System (SG-SST). This system, regulated by Decree 1072 of 2015, seeks to



create safe work environments through processes and practices that prevent accidents and occupational diseases.

Studies conducted in companies in the hydrocarbon sector in Colombia have revealed that one of the most common problems are musculoskeletal disorders, often linked to failures in epidemiological prevention programs. Although there are no similar studies in Ecuador, it is recognized that both countries face common challenges due to the risky nature of work in the oil sector.

In summary, both Colombia and Ecuador have built legal frameworks aimed at protecting the occupational health of their workers. However, they still face great challenges, especially with regard to the effective implementation of these norms and the development of programs that really have an impact on the prevention of occupational diseases. This reality highlights the importance of greater collaboration between governments, companies and workers to continue moving towards safer and healthier work environments in the oil industry.

METHODOLOGY

For the development of this research, a systematic and detailed review of various documentary sources from both Colombia and Ecuador was carried out. The objective was to gather reliable and updated information that would allow a thorough understanding of how occupational health and safety is addressed in the oil sector in both countries.

In this process, multiple recognized sources were consulted, including official government websites, specialized journals, academic databases such as Google Scholar and SciELO, as well as university repositories.

To guide the search and ensure the relevance of the contents, keywords such as occupational safety, occupational health, employment in the oil sector and labor welfare were defined. These words were fundamental to find studies, regulations and analysis relevant to the topic.

In order to broaden the scope of the information and enrich the perspective of the analysis, documents in English and French were also incorporated and carefully translated to ensure an accurate understanding of their content.

Thanks to this methodological approach, it was possible to build a broad and comparative vision of the situation of the oil sector in Colombia and Ecuador, highlighting the most relevant aspects of occupational health and safety that affect thousands of workers in this important industry



RESULTS AND DISCUSSION

When it comes to occupational safety and health, both Colombia and Ecuador have developed regulatory frameworks that seek to ensure safe and healthy work environments, especially in high-risk sectors such as the oil industry. The following are the most relevant findings in each country in relation to this issue.

In the case of Colombia, the regulations governing oil activities are aimed at protecting the physical and emotional integrity of workers. One of the main pillars is Decree 1072 of 2015, which establishes the guidelines of the Occupational Safety and Health Management System (SG-SST). This system includes risk assessment, continuous training of personnel and the implementation of preventive programs. In turn, Law 1562 of 2012 updates the approach to occupational hazards, emphasizing the need to create a safety culture within organizations.

One of the most common risks in the Colombian oil industry is related to musculoskeletal health, due to forced postures or repetitive movements, which can seriously affect the quality of working life. To also address the handling of chemical substances, Decree 1496 of 2018 establishes specific measures within the management system, including the mandatory use of personal protection elements and constant training of exposed personnel.

Ecuador has an Occupational Health and Safety Regulation, backed by Executive Decree No. 255 of May 2, 2024, which highlights the importance of identifying risks and training workers as priority measures. In addition, Ministerial Agreement No. MDT-2024-196 details the responsibilities of both employers and workers, aiming at a culture of prevention and shared commitment.

In the Ecuadorian oil sector, no specific information was found on risks similar to those in Colombia, but due to the nature of the work, it is likely that there are physical and chemical hazards that also require attention. In addition, Ministerial Agreement 1404 regulates the provision of corporate medical services, ensuring that workers have access to timely and adequate care to prevent and treat possible health problems.

In summary, both countries show a clear commitment to worker protection in the oil sector. While Colombia has placed a strong emphasis on occupational risk management systems and the handling of

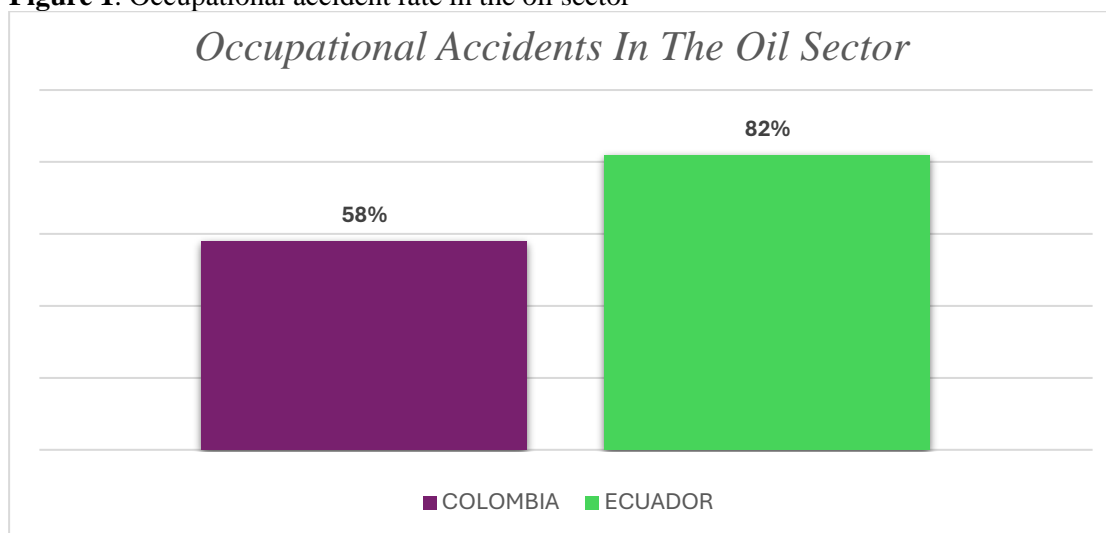


hazardous substances, Ecuador has focused its efforts on mandatory training and comprehensive prevention.

However, challenges persist in both contexts. In Colombia, musculoskeletal disorders are a recurrent problem. In Ecuador, although the specific risks are not fully documented, hazards associated with the physical and chemical work environment are presumed to exist.

Both Colombia and Ecuador have built solid legal frameworks, but their true effectiveness will depend on how these regulations are implemented on a day-to-day basis. In an industry as demanding as the oil industry, promoting a culture of care and prevention is not only a legal obligation, but also an ethical responsibility to those who make its operation possible.

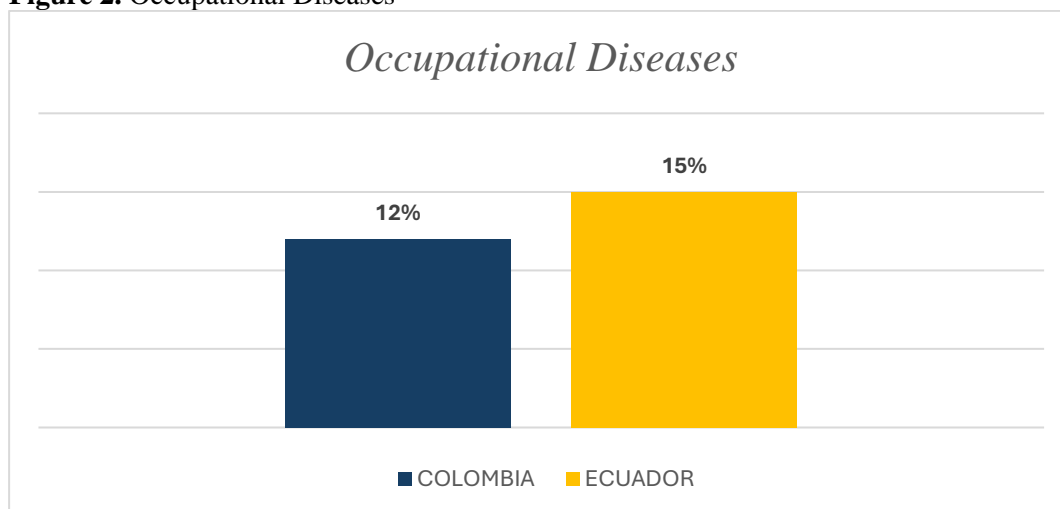
Figure 1. Occupational accident rate in the oil sector



Fountain: Pabon, H. (2025).

In the first graph, it can be seen that Ecuador has a higher occupational accident rate than Colombia, suggesting that the oil sector in Ecuador faces significant occupational health risks. This situation could be a reflection of various circumstances, such as the implementation of risk management or preventive safety culture in the work environment.

Figure 2. Occupational Diseases



Fountain: Pabon, H. (2025).

The second graph reveals that the percentage of workers who have reported occupational diseases is higher in Ecuador compared to Colombia. This suggests that Ecuadorian workers may be exposed to more unfavorable conditions or that preventive measures to combat occupational diseases are less effective in their country.

Figure 3. Security Training



Fountain: Pabon, H. (2025).

The third graph shows a notable difference: Colombia has a higher percentage of oil sector workers trained in occupational health issues compared to Ecuador. This indicates that the Colombian approach to training and prevention is stronger, which probably contributes to a lower occurrence of occupational accidents and diseases.

In contrast, Ecuador faces greater challenges in terms of accidents and occupational pathologies, which highlights the urgent need to strengthen working conditions and reinforce preventive actions within the sector.

Colombia's advantage in terms of training could be playing a key role in its better occupational health and safety indicators. This situation reinforces the importance of continuing to invest in training and constant updating programs for workers.

Both Colombia and Ecuador have the opportunity to review and improve their occupational health policies, focusing especially on those areas where risks are highest. Continuous training not only prevents accidents, but also protects the lives and well-being of those who support this industry with their work on a daily basis.

CONCLUSIONS

A comparison between Colombia and Ecuador in terms of occupational health in the oil sector reveals both commonalities and important differences in the way each country protects its workers. Although both have built legal frameworks to ensure safe working environments, there is still much to be done to ensure that those standards are effectively and continuously enforced.

In the case of Colombia, Decree 1072 of 2015 establishes a solid structure for identifying risks, training workers and acting preventively. However, despite these advances, musculoskeletal disorders caused by repetitive movements or poor posture are still frequent. This shows that, beyond regulations, it is essential to strengthen preventive strategies focused on the real risks of day-to-day work.

On the other hand, Ecuador has implemented more recent regulations, such as Ministerial Agreement No. MDT-2024-196, which establishes clear responsibilities in occupational health. Even so, the figures show a higher rate of occupational accidents and illnesses compared to Colombia. This suggests that the regulations, although they exist, are not being applied rigorously enough to generate real changes in working conditions.

Hence the importance of promoting a more active prevention culture in the Ecuadorian oil sector.

One of the factors that makes a difference is training. In Colombia, a higher proportion of workers have received health and safety training, which could be influencing the reduction of incidents. This



highlights the need for Ecuador to strengthen its training and awareness programs, ensuring that workers are not only aware of the risks, but also know how to deal with them.

Ultimately, both Colombia and Ecuador share a commitment to protecting the health and well-being of those working in the oil industry. However, each country faces particular challenges that must be urgently addressed. Strengthening regulatory frameworks, focusing on prevention and promoting continuous training are not only desirable goals, but essential steps to build safer and more humane work environments. To achieve this, a joint effort by governments, companies and workers is required.

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