

## Eco-Champions: A Deep Dive into Kurdistan Companies' Environmental Stewardship

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**Abstract:** The Kurdistan region is all about keeping it green for a sustainable future. As they're growing economically and getting into the industrial game, they've got their eyes on balancing the hustle with protecting the environment. Think renewable energy, eco-friendly buildings, and holding onto their natural treasures like forests and biodiversity. It's a team effort involving the government, businesses, communities, and each person to ensure the region stays solid and sustainable. So, we did some digging to see what companies in Kurdistan are up to in the environmental protection department and why some might be slacking off. Our survey game was strong – we threw out questions, got the lowdown from these companies, and analyzed the info that rolled in. It turns out that the companies we checked out are on the green train. Every single one of them is committed to doing their bit for the environment. They're not just talking the talk; they're walking the walk, positively impacting cleanliness and keeping things eco-friendly.

We had them spill the beans in our survey – some written answers, the whole nine yards. These Kurdistan companies shared their experiences on the environmental protection front and spoke about the hurdles they faced. It's clear as day – these companies are serious about keeping it green. Sure, a few might be just doing okay on the commitment scale, but a good chunk of them are going all out. They're not just meeting but exceeding the environmental standards set by the Kurdistan Regional Government. It's a thumbs-up from these companies for environmental protection, and they're not just satisfied – they're pretty happy with the commitment levels set by the regional government. Go green or go home seems to be the motto here!

**Keywords:** Kurdistan Region, Protect Environment, Company, Kurdistan Monitoring environmental.

## I. Introduction

Environmental monitoring, involving the real-time assessment of factors like vibrations, noise levels, and dust on construction sites, is pivotal in aligning industrial activities with ecological responsibility. These monitoring tools not only facilitate compliance with regulatory standards, such as Section 61 of the Control of Pollution Act 1974 (Move-x, n.d.), but they also play a crucial role in minimizing environmental impact, reducing work delays, and ensuring harmony within the local community (Technology, 2022).

### 1. Unveiling the Significance and Objectives of Environmental Monitoring:

Environmental monitoring is not merely a regulatory obligation; it's a proactive measure to understand and enhance the quality of our surroundings. It serves as a valuable decision-making tool for both government and non-governmental bodies. The primary purpose lies in discerning trends and patterns related to air pollutants in the atmosphere, providing actionable insights into improving air quality and overall environmental health.

The objectives of environmental monitoring vary across situations but share common goals. Firstly, it ensures companies adhere to

stringent environmental regulations, fostering responsible corporate practices. Secondly, it evaluates the efficacy of newly installed machinery, promoting technological efficiency while minimizing ecological impact. Thirdly, it safeguards the health and well-being of employees, acknowledging the direct link between a healthy workforce and a sustainable environment. Beyond corporate realms, environmental monitoring acts as a sentinel for potential risks to human and wildlife populations. Identifying environmental threats enables informed decision-making regarding population migration from densely populated areas to regions with lower ecological footprints. Additionally, the monitoring process aids in curbing gas emissions, contributing to the overarching goal of reducing environmental pollution and promoting sustainable practices (Perfect Pollucon Services, 2014).

### 2. An overview of environmental challenges faced by companies operating in Kurdistan.

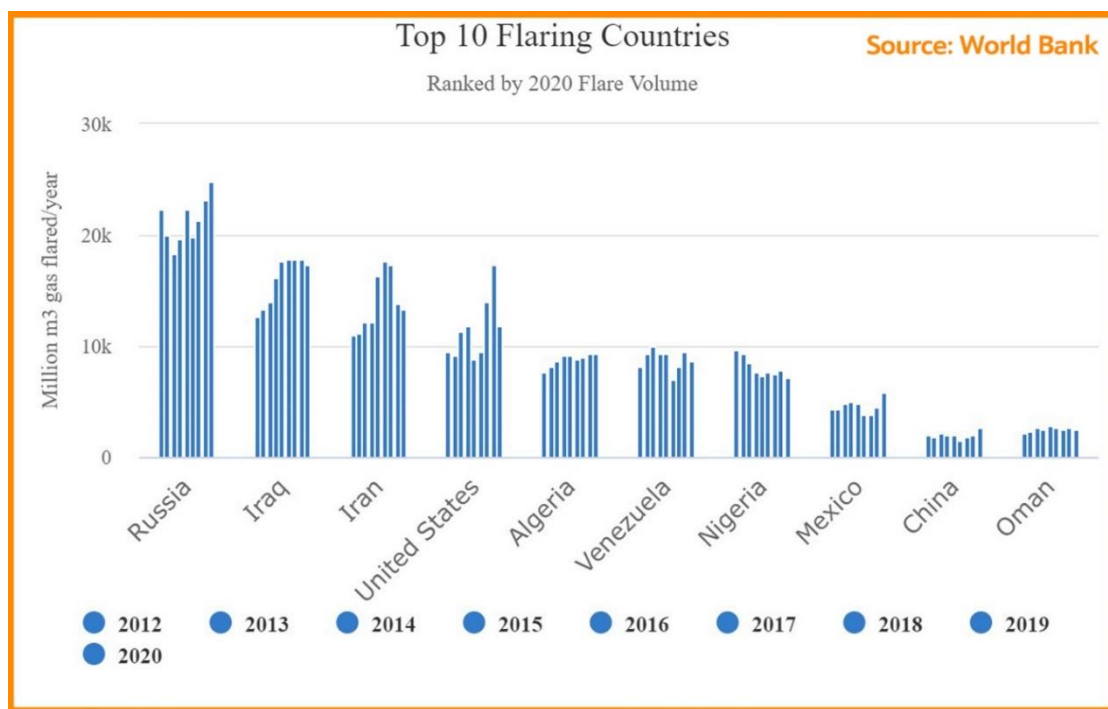
Companies operating in Kurdistan's oil sector face a significant environmental challenge - the flaring of associated gas. This toxic byproduct of crude oil production has been routinely burned off since the region's oil fields began operations. However, a recent directive from the Kurdistan Regional Government (KRG) is set to change this practice, aiming to halt flaring within 18 months

(Report, 2021). The KRG's decision, issued by Minister of Natural Resources Kamal Atroshi, marks a pivotal shift towards environmental responsibility. The move is a response to curb the environmentally damaging practice of burning associated gas during oil production. While the intention is clear, challenges loom, given the region's underdeveloped industry and substantial debts owed to oil companies.

Implementing this directive is not without hurdles. The KRG faces potential resistance and complications in enforcing a shift to a more expensive process, even with the threat of taxes as a punitive measure for non-compliance. The 18-month timeline raises questions about its feasibility, with concerns expressed by experts like Shwan Zual, a political analyst and managing director of Carduchi Consulting. Zual highlights the industry's varying maturity levels, emphasizing that what might be feasible for some companies could pose significant challenges for others. He suggests that companies may argue against the directive, citing contractual obligations or a lack of mobilization for such changes (Report, 2021). Kurdistan's endeavour to tackle environmental challenges in its oil industry reflects a growing awareness of the need for sustainable practices. However, the 18-month ultimatum underscores the delicate balance between environmental responsibility and the industry's practical constraints. The KRG's

decision, while commendable, requires careful consideration and potential adjustments to accommodate the diverse circumstances of oil companies operating in the region. As the industry navigates this shift, collaborative efforts between the government and companies will be crucial to achieving both environmental goals and industry stability.

The Kurdistan Region, boasting 52 oil blocks with 16 in production and 15 in exploration phases, faces a critical juncture in its oil industry. With over 30 international and local companies involved, the sector's financial intricacies are significant in addressing environmental concerns, particularly the flaring of associated gas (Shakir, 2023). A key factor influencing efforts to end gas flaring is the Kurdistan Region's substantial indebtedness. The Council of Ministers Secretary General, Amanj Raheem, revealed in late June that the KRG carries a debt of approximately \$4.3 billion to oil companies, inherited from a previous administration burdened with a \$28 billion debt (Shakir, 2023). This financial strain challenges the region's ability to invest in sustainable practices. Among the owed companies is Genel Energy, which served a termination notice for two contracts by the KRG. Despite receiving \$30.4 million for oil sales in May, Genel Energy remains owed \$141 million, illustrating the financial complexities in the region's oil transactions (Shakir, 2023).



Iraq, including the Kurdistan Region, ranks second globally in flaring associated gas, trailing only Russia. In 2020, Iraq flared 17.37 billion cubic meters of gas, emphasizing the urgency of addressing this environmental issue (Flaring, 2023). Minister of Natural Resources Kamal Atroshi is determined to curb this long-standing practice, asserting non-compliant companies will face taxes (Flaring, 2023). The intersection of financial challenges and environmental goals in Kurdistan's oil sector underscores the delicate balance required for sustainable practices. The debt burden on the KRG and ongoing contractual issues pose hurdles in executing environmental initiatives. As Iraq grapples with its global ranking in gas flaring, collaborative efforts between the

government and indebted companies become paramount for realizing economic stability and environmental responsibility.

**3. A positive effect on the sustainability of our operations**

The dynamic process of monitoring, reviewing, and reporting on socio-environmental risks and impacts is pivotal in averting unforeseen events. This comprehensive approach paints a vivid picture of risk status and facilitates swift decision-making to align operations with objectives.

**Key Benefits of Continuous Monitoring:**

- Practical Implementation of ESMPs: Rigorous monitoring ensures the efficient execution of Environmental and Social

Management Plans (ESMPs), fostering a positive environmental impact.

- **Adaptability to Unforeseen Changes:** Identifying shifts in social and environmental management measures allows proactive adaptation to unexpected circumstances.
- **Technical Guidance for Challenges:** Continuous monitoring provides accurate technical guidance, addressing environmental and social performance or compliance challenges.
- **Stakeholder Engagement:** Timely response to stakeholders' concerns enhances trust and commitment, fostering a collaborative approach to sustainable practices (Adam, 2023).

This approach safeguards against unexpected events and positions operations for enduring success in socio-environmental responsibility.

## II. Literature Review

### 1. Environmental Benefits through Sustainable Practices:

Sustainable practices offer many advantages for businesses, extending far beyond environmental benefits. When effectively implemented, these practices contribute to increased financial returns, heightened operational efficiencies, bolstered corporate reputation, enhanced employee productivity, and improved customer satisfaction. According to a survey by the Global Opportunity Network, over 80% of investors recognize the value of companies embracing sustainability, anticipating higher yields due to a stable foundation for growth. Additionally, businesses adopting sustainability initiatives often benefit from tax credits, subsidies, and access to low-cost capital, aligning with government policies promoting environmental responsibility (Freelance, 2017).

The financial gains from sustainable practices are notable, with the expected outcomes of reduced energy and raw material costs. Operational efficiencies are a natural byproduct of incorporating sustainability into business operations, creating a competitive advantage over peers (Syengo, 2017).

### 2. Government-led Environmental Protection Initiatives:

In the Kurdistan Region, the Environmental Protection and Improvement Board spearheads environmental protection projects awaiting approval from the Council of Ministers. These initiatives aim to curb pollution and enhance sustainability. The first project involves establishing an air quality assessment centre to identify pollution sources. The second project, already in progress, focuses on replacing nylon bags with environmentally friendly paper bags. The third project aims to implement a mechanism for recycling plastic waste, mainly plastic drinking bottles (Environmental Protection, 2019).

The air quality assessment centre, estimated at half a million dollars, will monitor gases from factories, generators, cars, and electric stations, offering insights into their contributions to air pollution. This initiative aligns with global practices in developed countries and aims to identify pollution sources for collaborative solutions with relevant ministries. The region's reliance on non-renewable energy, particularly personal generators, and the absence of public transportation contribute significantly to air pollution. The environmental projects seek to address these challenges, emphasizing the importance of adopting sustainable practices for a healthier and more eco-friendly Kurdistan (Shilani, 2019).

Sustainable practices not only present financial gains and operational efficiencies for companies but also contribute to broader environmental protection efforts. The government-led initiatives in the Kurdistan Region reflect a commitment to systematically addressing ecological challenges.

### 3. Addressing Environmental Challenges by the Kurdistan Regional Government (KRG):

Environmental problems pose significant challenges in urban areas, particularly in cities like Erbil, the capital and most populated city in the Kurdistan Region of Iraq (KRI). These issues encompass water, land, noise, and air pollution, with roots in factors such as political instability, socio-economic changes, rapid urbanization, and population growth, exacerbated by the aftermath of wars and damages endured over the last few decades (Typeset, 2023; PRMC, 2023). However, a substantial portion of these challenges stems from the region's lack of critical infrastructure and comprehensive environmental research studies.

To combat these environmental woes and promote awareness, the University of Kurdistan Hewlêr (UKH) is taking proactive steps by planning to establish a Centre for Environmental Studies (CES). The centre aims to address pollution issues, improve public and human health, and enhance environmental awareness by filling the gaps in infrastructure, research, and public education (Admin, n.d.).

### 4. Environmental Regulations for Companies Operating in Kurdistan:

The Kurdistan Regional Government emphasizes the health, safety, and sustainable development of resources. This commitment extends across the energy sector, urging local and international partners to prioritize safety, security, and readiness procedures in their operations (Media Staff, 2013).

The regulatory framework for environmental protection in Kurdistan is governed by three essential laws and documents: The Law of Environmental Protection and Improvement, the Oil and Gas Law, and the production-sharing contracts. These regulations mandate companies to conduct environmental impact assessments before commencing commercial or industrial activities (Qadir, A. M. A. et al., 2023). Moreover, companies must compensate landowners for damages to crops or surrounding lands, fostering accountability and responsible environmental practices. The Kurdistan Regional Government's proactive stance in addressing ecological challenges and establishing the Centre for Environmental Studies by the University of Kurdistan Hewlêr reflects a commitment to fostering sustainability and awareness. Simultaneously, stringent environmental regulations ensure that companies operating in Kurdistan adhere to practices prioritizing safety, ecological impact assessments, and compensation for any harm caused. These combined efforts pave the way for a more environmentally conscious and responsible Kurdistan.

Under production-sharing contracts, companies operating in Kurdistan must contribute annually to an environment fund. These contracts mandate adherence to international petroleum industry standards and the Kurdistan Region's laws, emphasizing pollution prevention and environmental protection, including fauna and flora preservation, safeguarding property, agricultural areas, and fisheries. Additional contractual obligations involve preventing environmental damage during pipeline construction and adhering

to international petroleum industry standards for decommissioning or surrendering contract areas (Askari, 2023).

To reinforce regulatory oversight, the Ministry has recently instituted the Health, Safety and Environment Department (HSED) to oversee regulatory activities. The department's mission is to facilitate the responsible development of the Kurdistan Region's hydrocarbon resources, meeting the region's needs while prioritizing social and environmental responsibility.

The HSED, as outlined in the contracts, has several key responsibilities:

- **Regulation and Monitoring:** The department regulates and monitors the hydrocarbon industry, identifying and mitigating unsafe and environmentally damaging practices throughout exploration, development, production, and rehabilitation stages (Perrault, 2022).
- **Supervision and Compliance:** Ensuring industry compliance with primary and secondary legislations, accepted standards, and guidelines for environmental protection, health and safety.
- **Guideline Development:** Developing and disseminating relevant instructions and guidelines concerning environmental, health, and safety issues associated with natural resource exploitation in the region.

These activities collectively contribute to responsible hydrocarbon development, emphasizing sustainable prosperity for the Kurdistan Region. Establishing the HSED underscores the commitment to balancing economic growth and environmental stewardship (Askari, 2013).

#### 5. Government Agencies' Role in Environmental Justice:

Government agencies are pivotal in upholding environmental justice legislation, a framework to mitigate the unequal burden of environmental hazards on marginalized communities. These agencies play a crucial role in ensuring that all individuals, regardless of socioeconomic status or race, enjoy equal access to a clean and healthy environment (Hallo Askari, 2023).

A primary function of these agencies is developing and implementing policies and regulations specifically designed to address environmental justice concerns. These policies are crafted to prevent and alleviate injustices, such as the disproportionate placement of hazardous waste facilities in low-income neighborhoods or the uneven distribution of pollution sources (Ecogov, 2023).

Government agencies wield the authority to enforce compliance with environmental justice laws through various means. Conducting inspections, investigations, and audits, they ensure that businesses and industries adhere to the regulations outlined in ecological justice legislation. In cases of non-compliance, these agencies possess the power to impose fines, penalties, and even shut down operations that violate environmental justice standards (Bamji, 2023).

#### 6. Environmental Monitoring: A Pillar of Effective Environmental Management:

Environmental Monitoring Programs (EMPs) play a pivotal role in identifying potential contamination sources, validating sanitation programs, and maintaining the overall cleanliness of facilities. The benefits of an EMP include:

- **Validation and Verification:** EMPs validate and verify the effectiveness of cleaning and sanitation programs, ensuring adherence to established procedures and frequencies (Appleby, 2023).
- **Effectiveness Assessment:** These programs provide data on the overall effectiveness of sanitary programs, personnel practices, and operational procedures. Regular monitoring allows for proactive measures in case of emerging issues.
- **Preventing Outbreaks:** EMPs offer data on indicator organisms, spoilage organisms, and pathogens, aiding in preventing outbreaks.
- **Facility Maintenance:** By determining if facility maintenance is required, such as filter changes, EMPs contribute to a proactive approach to facility upkeep.
- **Baseline Assessment:** EMPs act as a baseline microbiological assessment of a facility's environment, aiding in continuous improvement efforts.
- **Contamination Prevention:** Through consistent monitoring and swabbing of different sites, EMPs help identify and eliminate potential contamination sites before issues escalate (Team, 2019). Incorporating diverse swabbing sites enhances the program's effectiveness, reducing the likelihood of undetected contamination. The implementation of EMPs thus emerges as a crucial tool in maintaining environmental integrity and preventing health risks.

#### 7. Environmental Cost-Benefit Analysis (Atkinson & Mourato, 2008):

Environmental cost-benefit analysis (CBA) is an economic evaluation method applied to policies and projects intentionally designed to enhance environmental services or actions that may indirectly impact the environment. This appraisal approach scrutinizes the financial implications of initiatives with environmental implications, providing a comprehensive framework for decision-making (Atkinson, 2008).

#### 8. Estimating the Cost of Environmental Monitoring (Kalish, 2018):

Small business owners and operators producing ready-to-eat (RTE) foods often encounter surprises when learning about the U.S. Food and Drug Administration's (FDA) expectation for them to conduct environmental monitoring. This requirement is contingent on two conditions: including environmental pathogens in hazard evaluations and determining that an environmental pathogen, such as *Listeria monocytogenes*, poses a hazard, necessitating preventive control measures. Understanding and meeting these criteria are vital for compliance with the Preventive Controls for Human Food rule's Subparts C & G, reflecting the evolving landscape of food safety regulations (Kalish, 2018).

#### Hazard Evaluation and Environmental Monitoring (Kalish, 2020):

The necessity for environmental monitoring, as outlined by the Preventive Controls for Human Food rule, hinges on factors such as the nature of the food being manufactured. For instance, environmental monitoring might be exempt if a food like salsa undergoes a lethal treatment post-packaging. However, manufacturers must evaluate environmental pathogens in their hazard assessment if the food is ready-to-eat (RTE), exposed to the

environment before packaging, and lacks a significant pathogen-reducing control measure (Kalish, 2020).

**9. Challenges and Future Directions in Kurdistan (Hub, 2019; Yousuf et al., 2018; Akiko Yoshioka, 2020):**

Companies in Kurdistan grapple with various challenges in effectively monitoring environmental costs and benefits, impacting their ability to assess and manage the environmental impact of their operations. Key challenges include:

- **Lack of Environmental Regulations and Standards:** The absence or inadequate enforcement of environmental regulations and standards in Kurdistan poses a significant hurdle for companies, hindering the establishment of clear monitoring guidelines.
- **Limited Access to Data and Information:** Companies face difficulty accessing reliable and up-to-date data on environmental factors, such as air and water quality and biodiversity.
- **Insufficient Monitoring Infrastructure:** The lack of proper monitoring infrastructure, including stations and equipment, further complicates monitoring efforts for companies in Kurdistan.
- **Political and Security Instability:** The region's political and security situation introduces uncertainties, impacting companies' ability to monitor environmental costs and benefits. Instability and conflict disrupt monitoring activities and impede the implementation of long-term programs.

To overcome these challenges, companies in Kurdistan are advised to:

- Advocate for stronger environmental regulations.
- Invest in monitoring infrastructure.
- Build internal capacity through training and knowledge sharing.
- Actively engage with stakeholders to foster transparency and collaboration.

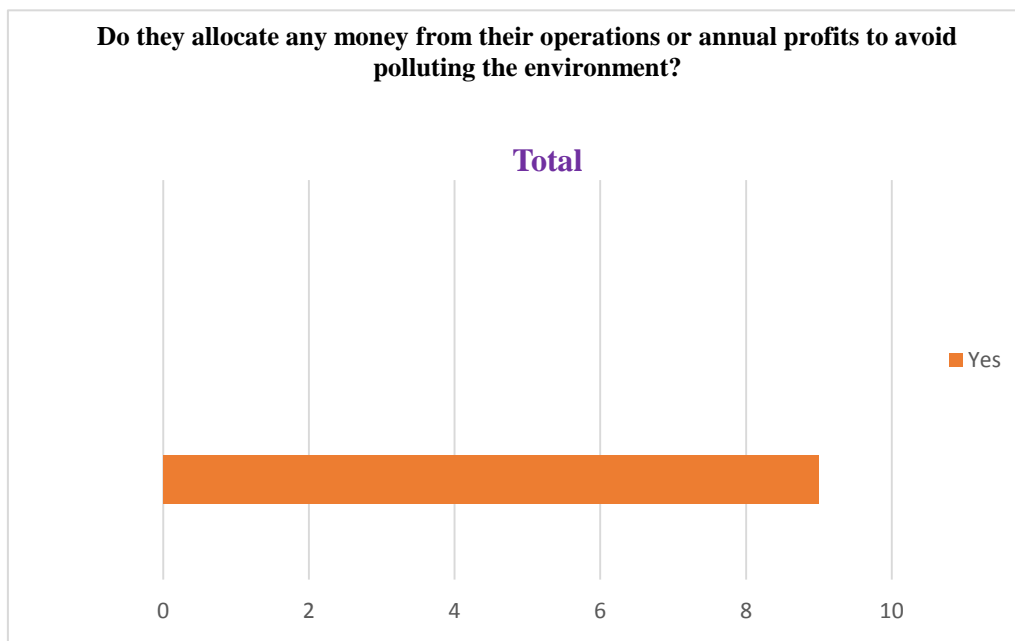
By taking these steps, companies can enhance their ability to monitor, assess, and manage environmental costs and benefits effectively, contributing to the region's sustainable and responsible business practices.

**III. Research Methodology**

In this research, we employed various techniques, primarily surveys and company visits, to gather data within the Kurdistan Region. The focus was on understanding how companies in the region engage in environmental protection and examining governmental measures in place. Our data collection involved direct interactions with several companies to gauge their environmental commitment based on comprehensive information. Using these insights, we presented examples of environmental protection initiatives taken by Kurdistan companies. The upcoming analysis will delve into the intricacies of this data, employing graphs to illustrate trends and patterns. Our research's overarching goal is to explore the methodologies used by Kurdistan companies in environmental protection and provide a detailed analysis of the amassed information.

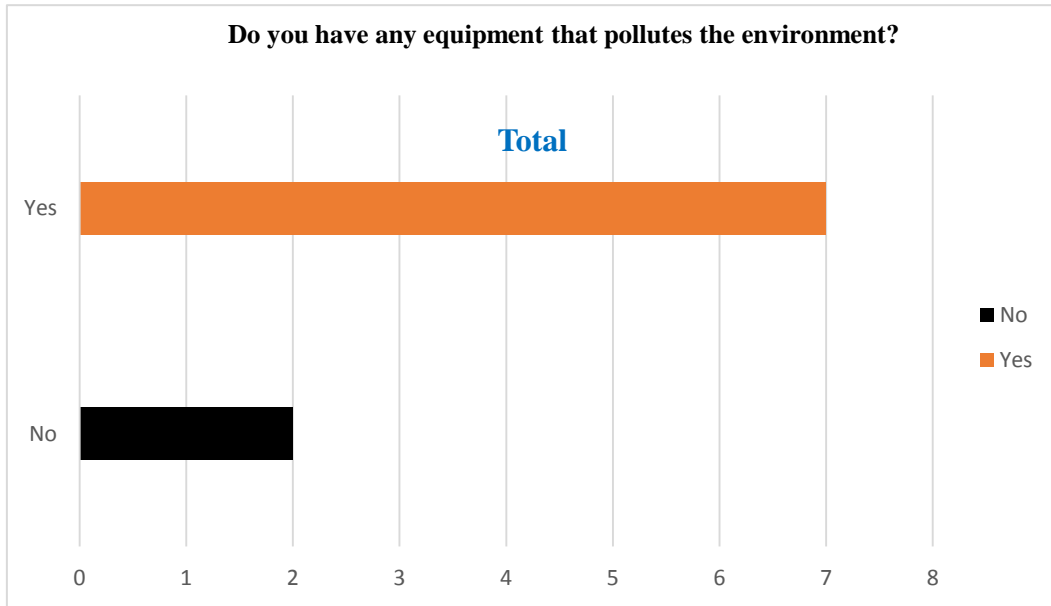
**SURVEY RESULTS:**

**Chart (1): Do they allocate any money from their operations or annual profits to avoid polluting the environment?**



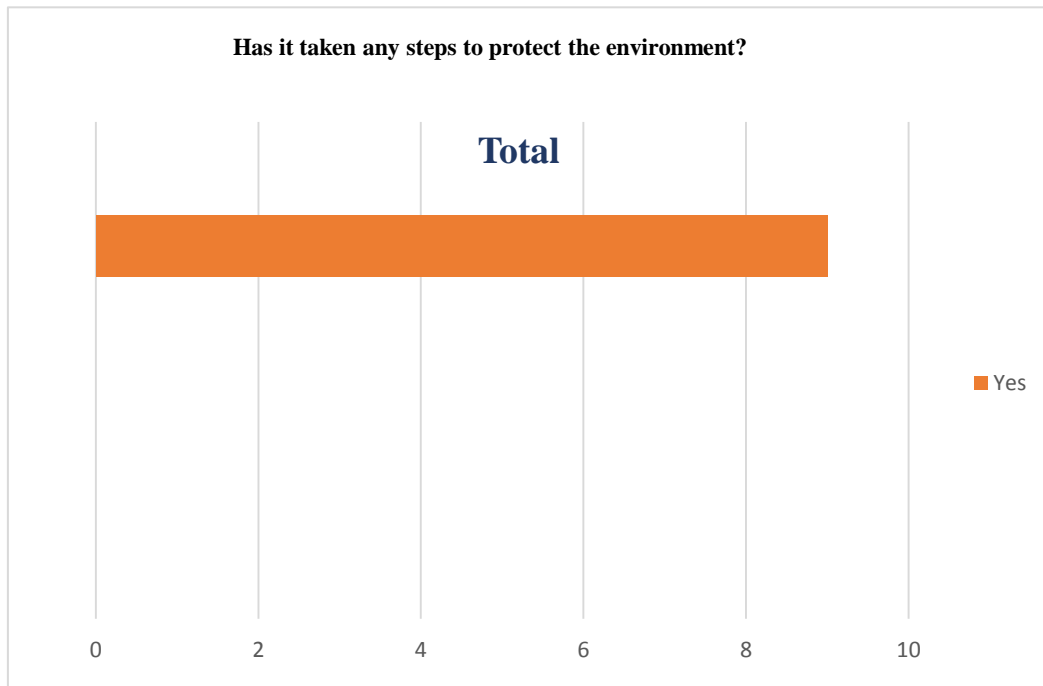
In the first chart, nine Kurdish companies responded that they allocate some of their annual profits to environmental protection, which means that Kurdish companies have spent some of their annual profits on environmental protection.

**Chart (2): A brief breakdown of companies, do you have any equipment that causes environmental pollution?**



As shown in Chart (2) only two out of nine companies do not have equipment to pollute the environment, this shows that Kurdistan companies in general cause environmental pollution with their equipment.

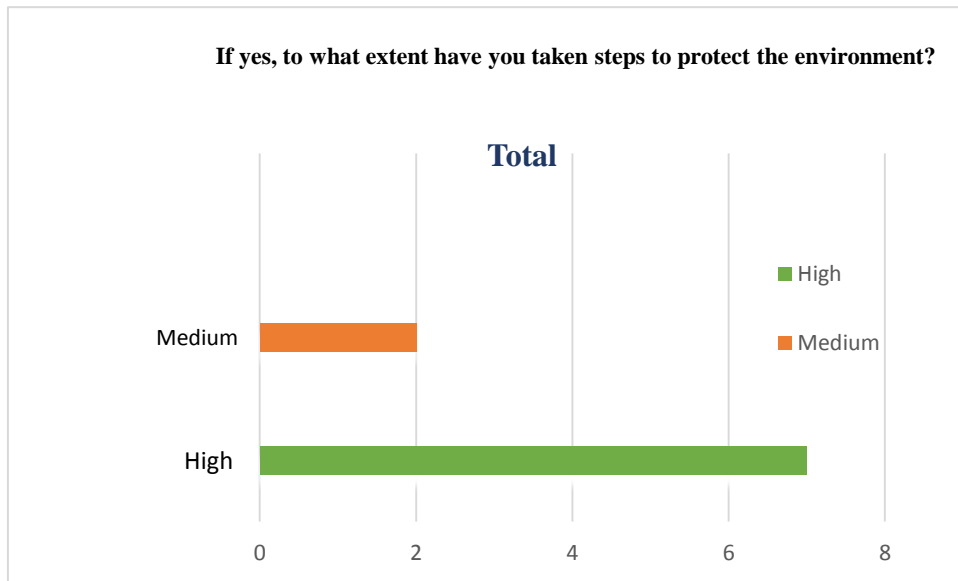
**Chart 3): Corporate efforts to protect the environment.**



As shown in Chart (3), among the companies that responded to us, Kurdistan companies in general, they have always tried to protect the environment and have moved towards a better environment.

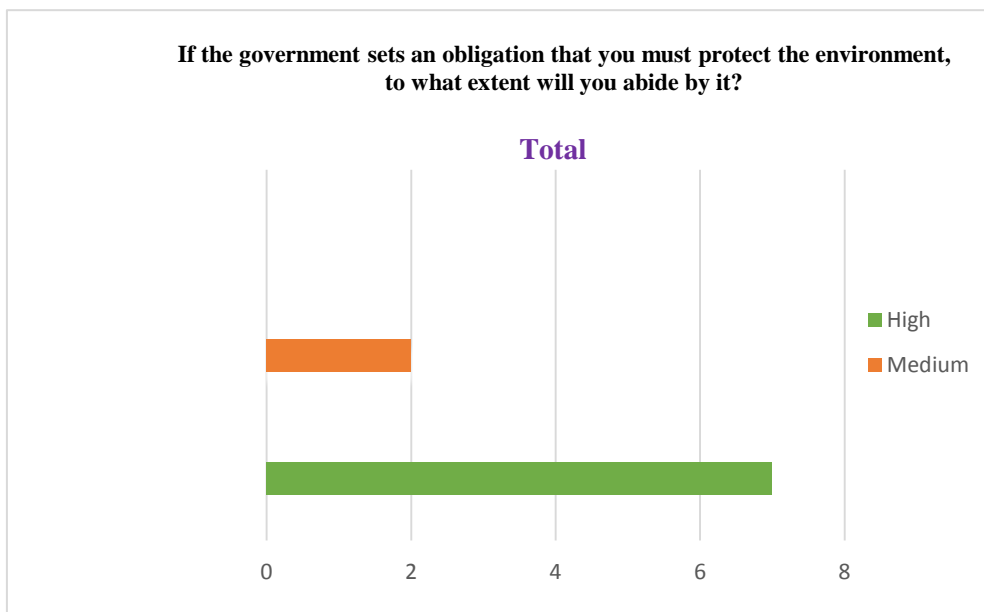


**Chart (4): Distribution of companies by their level of commitment to environmental protection.**



As shown in Chart (4), Response Kurdistan companies have generally shown a high level of commitment to take steps to protect the environment This will maintain a safe environment, although some companies take moderate steps to protect the environment.

**Chart (5): Companies react when the government imposes environmental compliance.**



As shown in (Chart 5) the environmental compliance of companies in the Kurdistan Region, focusing on their responses to government regulations and the measures they undertake for environmental protection. Utilizing Chart 5, which illustrates the correlation between government obligations and companies' compliance levels, we found that most companies in Kurdistan exhibit a high level of preparedness and adherence to environmental regulations.

**Survey Insights and Company Responses:**

In our survey, companies were required to provide written responses detailing their environmental protection practices and encountered obstacles. The responses showcased a diverse range of efforts made by companies to mitigate their environmental impact:

**Smoke Filtration Company:** One company employs a two-filter system to manage smoke emissions effectively. The filters prevent odours and turn the smoke white, eliminating pollutants. Powered solely by electricity, this eco-friendly equipment spans 35 acres of greenery.

**Oil and Gas Recycling Company:** Another company involved in oil and natural gas production focuses on waste reduction through recycling. They have established recycling stations for plastic, metal, glass, and miscellaneous waste. Moreover, the company aims to redirect more natural gas to the Chamchmal power plant, reducing the amount burned compared to previous years.

**Waste Transport and Tree Plantation Company:** One company deals with waste transport and has taken steps to plant trees.

However, pollution impedes tree growth in the designated area. Despite challenges, the company actively transports waste to a municipality-designated location away from the city, working with water to avoid sand pollution.

**Poultry Farm-Related Company:** A company associated with poultry farms acknowledges the environmental impact of farm odours. They employ recycling methods to counter this, transforming waste into environmentally friendly by-products. Chemical foam is repurposed into plants, showcasing a commitment to sustainable practices.

#### **Overall Commitment and Satisfaction:**

The study underscores the notable commitment of Kurdistan companies to environmental protection. While some exhibit moderate commitment, a substantial number express a high dedication to cleanliness and environmental sustainability. Overall, most companies are content with the environmental obligations the Kurdistan Regional Government sets forth.

## **IV. Conclusion:**

Environmental monitoring is critical in identifying contamination sources, validating sanitation programs, and fostering sustainable practices. In the Kurdistan Region, challenges hinder effective tracking, including the absence of regulations, limited data access, insufficient infrastructure, and political instability. However, environmental protection laws and contracts, such as the Oil and Gas Law and production-sharing agreements, provide a framework for companies to ensure health, safety, and environmental responsibility. Environmental Monitoring Programs (EMPs) yield various benefits, such as validating cleaning programs, providing data on overall effectiveness, enabling proactive problem-solving, identifying indicator organisms, determining facility maintenance needs, and acting as a baseline microbiological assessment. These benefits contribute to informed decision-making, pollution reduction, resource conservation, and a commitment to corporate social responsibility.

#### **Environmental Accountability and Sustainable Future:**

Promoting environmental accountability is pivotal for Kurdistan's sustainable development amid economic growth and industrial expansion. It ensures that businesses operate conscientiously, considering their ecological impact. Sustainable practices, guided by rigorous environmental monitoring, allow companies to assess their ecological footprint, identify areas for improvement, and contribute to a greener future. As Kurdistan advances economically, a steadfast commitment to environmental protection is vital. The region can overcome challenges, safeguard natural resources, and address environmental issues by prioritising sustainability. Continued efforts in environmental accountability will benefit businesses and contribute to the well-being of ecosystems and public health.

#### **Here are some areas where continued efforts are needed:**

Encouraging sustainable development practices is crucial for Kurdistan's future, aligning economic growth with environmental protection. This involves advocating for renewable energy sources, adopting green building practices, and implementing sustainable transportation solutions to reduce carbon emissions and minimize resource depletion. Preserving and conserving natural resources such as forests, water bodies, and biodiversity is pivotal in maintaining ecological balance. Strategies to prevent deforestation,

ensure responsible water management, and protect biodiversity hotspots are essential to foster long-term environmental sustainability. By prioritizing sustainable development and conservation efforts, Kurdistan can pave the way for a resilient and environmentally sustainable future. Achieving this goal requires a collective commitment from government, businesses, communities, and individuals to protect the environment and create a thriving region while preserving natural resources for future generations.

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