



MINISTRY OF MINING, BLUE ECONOMY AND MARITIME AFFAIRS

STATE DEPARTMENT FOR MINING

DRAFT REGULATORY IMPACT STATEMENT (RIS)

FOR

**THE MINING (MINE HEALTH, SAFETY AND ENVIRONMENT) REGULATIONS,
2026**

JUNE 2026

1.0 Introduction

The Regulatory Impact Statement for the proposed Mining (Mine Health, Safety and Environment) Regulations, 2026 was prepared in accordance with the provisions of sections 6 and 7(1) and (2) of the Statutory Instruments Act, 2013. Section 6 of the Act requires the Regulation Making Authority to prepare a Regulatory Impact Statement for the proposed regulations indicating the costs and benefits of the proposed regulations on the public and stakeholders. Sections 7(1) and (2) of the Act set out the contents of a regulatory impact statement for the proposed regulations as follows:

2.0 Statement of the Objectives and Reasons for the Proposed Regulations

Justification for the Mining (Mine Health, Safety and Environmental) Regulations, 2026

Kenya's mining sector has experienced moderate growth following the enactment of the Mining Act, 2016, which introduced a more structured legal and institutional framework aimed at revitalising mineral exploration, licensing, and governance. Since its implementation, there has been a marked increase in mineral exploration activities and a continued rise in artisanal and small-scale mining (ASM) operations across the country (Ministry of Petroleum and Mining, 2021). Despite this progress, the mining and quarrying sub-sector has remained a relatively minor contributor to national GDP, accounting for approximately 0.6% in 2013. However, under the Vision 2030 economic blueprint, the Government of Kenya has set an ambitious target to increase this contribution to 10% by 2030, necessitating a substantial expansion of mining operations and sectoral investments (Republic of Kenya, 2016).

Artisanal and small-scale mining is particularly significant in Kenya's mining landscape. The sector directly employs 140,000 individuals and supports the livelihoods of over 800,000 Kenyans indirectly, accounting for more than half of the country's total mineral output, including most of the gold and gemstones (Mutembei et al., 2022; AWEIK, 2021). However, the ASM sector remains predominantly informal, with many operations conducted outside of the formal licensing regime and with little to no regulatory oversight. This informality exposes workers to considerable occupational hazards as they operate in structurally unstable environments, often relying on rudimentary and hazardous extraction techniques with minimal safety equipment or training (Yator et al., 2023).

Despite the sector's suppressed economic potential, mining in Kenya continues to be marred by pervasive health, safety, and environmental challenges. Mining is globally recognized as one of the most hazardous industries, accounting for an inconsistent number of occupational injuries, fatalities, and work-related diseases relative to its share of the workforce (International Labour Organization, 2015). In Kenya, these risks are compounded by inadequate enforcement of existing legislation, capacity gaps among regulatory institutions, and overlapping mandates across agencies. A performance audit by the Office of the Auditor-General (2022) revealed that the State Department of Mining, particularly the Directorate of Mines, was severely understaffed and lacked the technical personnel required to adequately inspect and monitor the country's numerous mining operations. Similarly, the National Environment Management Authority (NEMA), which is charged with overseeing environmental compliance, has faced chronic underfunding, logistical limitations, and human resource constraints, further limiting its ability to conduct effective environmental monitoring and enforcement (CSUD, 2013; Office of the Auditor-General, 2022).

The ASM sub-sector illustrates specific concerns regarding occupational safety and health. A majority of artisanal mining sites operate informally, without licenses, environmental approvals, or adherence to statutory health and safety standards. In several documented cases, artisanal miners have been found working on land already licensed to large-scale operators, often leading to jurisdictional conflicts and heightened risks of confrontation or accidents (Kamau, 2020). The informality of the sector promotes unsafe practices, including the use of hand-dug tunnels without proper ground support, inadequate ventilation, lack of access ladders, and poor emergency preparedness. These conditions frequently result in fatal pit collapses, shaft flooding, and serious injuries. Miners are routinely exposed to health hazards such as respirable silica dust, high-decibel noise from blasting or crushing, and toxic substances such as mercury, which is commonly used in gold amalgamation. The use of personal protective equipment (PPE) remains minimal in most artisanal sites, and occupational safety and health (OSH) training is rarely provided. Surveys conducted in Kisii, Siaya, and Migori counties indicate that fewer than 40% of miners had ever received any formal safety instruction, and only a minority consistently used PPE such as helmets or dust masks (Yator et al., 2023; AWEIK, 2021).

Beyond occupational hazards, informal mining activities are also associated with social risks, including the prevalence of child labor and gender-based vulnerabilities. Reports from gold mining zones in Migori and Kakamega have documented the involvement of children in hazardous tasks such as ore crushing, panning, and hauling, while women working in these environments often face systemic marginalization, sexual exploitation, and limited access to secure or well-paying roles (Mutembei et al., 2022; Ministry of Petroleum and Mining, 2021).

Environmental degradation associated with mining activities in Kenya is both widespread and acute, particularly in regions with limited regulatory oversight. Mining operations ranging from excavation and ore concentration to tailings disposal exert considerable pressure on land, air, and water resources. The most common impacts include deforestation, land scarring, loss of vegetation cover, and soil erosion, all of which contribute to reduced agricultural productivity and habitat loss (Sivi et al., 2019). In areas with unregulated waste disposal, toxic substances leach into surrounding ecosystems. Artisanal gold mining in particular poses significant water quality risks due to the extensive use of mercury for gold recovery. Studies conducted in Migori County, a region where approximately 40% of the population is dependent on ASM have revealed mercury concentrations in surface water up to 100 times above World Health Organization and NEMA safe drinking limits, with corresponding risks of mercury bioaccumulation in aquatic organisms (Odumo et al., 2014).

Acid mine drainage and sedimentation further exacerbate the degradation of riverine ecosystems, affecting both human and animal populations downstream. The discharge of untreated effluents from gold processing plants into rivers has been documented in several counties, contributing to long-term ecological decline and reduced water usability for domestic and agricultural purposes. Air quality near mine and quarry sites is significantly compromised by persistent dust and particulate emissions, which are associated with increased incidences of respiratory illnesses such as bronchitis, asthma, and chronic obstructive pulmonary disease in nearby communities (Office of the Auditor-General, 2022; CSUD, 2013).

Critically, these environmental and public health risks are magnified by weaknesses in institutional enforcement of environmental safeguards. NEMA, the principal agency for approving Environmental Impact Assessments (EIAs) and monitoring compliance, has acknowledged its

limited capacity to provide continuous oversight for mining projects, particularly in remote and dispersed ASM locations. In many instances, development projects with considerable environmental footprints have proceeded without comprehensive mitigation plans or post-EIA monitoring, a failure often attributed to staffing shortages, corruption, and bureaucratic inefficiencies (Office of the Auditor-General, 2022; CSUD, 2013). As a result, many mining operations, especially small-scale and unlicensed ventures, continue to operate without approved Environmental Management Plans (EMPs), enabling ongoing land degradation and pollution without regulatory consequence.

Kenya's mining sector is thus at a crossroads. At the same time, it holds increasing strategic and economic importance, but structural deficiencies hamper the sector in worker protection, environmental governance, and institutional coordination. The underlying causes of these challenges include outdated or incomplete legislation, institutional undercapacity, and the widespread informality of ASM activities. These conditions have created a regulatory vacuum, leaving mine workers vulnerable to preventable accidents and long-term health conditions, while exposing adjacent communities to unchecked environmental damage. Considering this, there is an urgent and compelling need to implement the Mining (Mine Health, Safety and Environment) Regulations, 2026 to establish harmonized, enforceable standards that directly address the sector's most pressing occupational and environmental risks.

The consequences of the above issues are evident in Kenya's mining accident records, public health reports, and environmental audits. Occupational accidents and fatalities in mining remain disturbingly frequent, especially in unregulated artisanal mines. Recent national data and incident reports illustrate the scale of the problem:

- i. Fatal mine collapses have occurred repeatedly. In Kenya's informal mining sites, basic safety measures are frequently absent: for example, miners may descend into deep, unsupported pits without helmets or harnesses, and use manual tools or improvised explosives with little training (Yator, Mburu, & Karanja, 2023). A recent survey of soapstone quarry workers in Tabaka, Kisii County found that an overwhelming 97% of workers had experienced some form of work-related injury. The most common injuries were cuts (52% of workers), fractures (25%), bruises (16%), and back or chest injuries (7%). These injuries were largely caused by preventable accidents: being struck by falling rocks, sharp stone shards, falls from heights, accidents with tools or machinery, lifting heavy loads, and collapsing excavation walls. Alarming, 93% of accidents in that study were not officially reported to any authority indicating a severe under-reporting problem and a lack of incident tracking in the mining sector (Yator et al., 2023). This under-reporting means official statistics likely underestimate the true scale of mining accidents, masking the extent of the problem and delaying corrective action.

Documented accident cases and media reports highlight the severity and often fatal consequences of these incidents. In one tragic example from February 2025, an artisanal gold miner in Bondo (Siaya County) was killed when an underground shaft collapsed on him. The victim, a 30-year-old man, was working with minimal support in an unsupported tunnel which caved in; despite rescue attempts, he was found dead by the time help reached him (Ondeng', 2025). Such mine collapses are a recurrent hazard in Kenya's gold mining areas (e.g. Migori, Siaya, and Kakamega), where rudimentary tunneling is common. In another region, Nakuru County, unregulated sand quarrying operations have repeatedly led

to deadly wall collapses. In 2018, at least eight sand harvesters lost their lives in a single year at the Rhonda quarries on the outskirts of Nakuru town due to pit wall collapses and landslides. One quarry owner recounted witnessing “scores of sand harvesters die when walls collapse on them,” including a father and son who were buried alive in one incident (Mwale, 2018). These grim events underscore that many Kenyan mines and quarries operate with “abandon and impunity,” lacking enforceable safety rules. Young workers, sometimes even school-aged youths, enter these pits armed only with shovels and no protective gear, driven by poverty and the hope of earning a meager income. As one 22-year-old sand miner explained, they routinely excavate 15-meter-deep pits without any safety helmets or support systems, and he has “seen many around him die when weakened steep walls collapse. This situation wholly illustrates the threatening trade-off that miners face: risking life and limb in the absence of proper safeguards, essentially “either they risk death or suffer loss of income” in these communities (Hussein, 2024).

- ii. Poor safety infrastructure and emergency response exacerbate the impact of accidents. The immediate safety hazards in mines include structural failures (cave-ins of shafts and tunnels), falls from height, being struck by rocks or moving equipment, electrocutions, and uncontrolled blasting accidents. For instance, mine tunnel collapses and underground entrapments have been identified as a leading cause of accidental injuries in small-scale mines across Africa. Kenyan artisanal miners in areas like Migori and Kakamega have suffered similar incidents; research in Migori County has linked injuries to events such as mine collapses and inadequate ground support (Mutonyi, 2019). Moreover, many accidents occur during the handling of tools and machinery a study in Siaya County found that mishandling of work tools was one of the most frequent causes of accidents among gold miners. The use of makeshift or poorly maintained equipment, combined with limited training, greatly increases the likelihood of injuries such as lacerations, amputations, and blunt force trauma (Elenge, Leveque, & de Brouwer, 2013). Another contributing factor is the often-chaotic work organization in informal mines: miners work long hours (sometimes well over 8 hours a day) in harsh conditions, and fatigue can lead to mistakes that cause accidents. Substance abuse has also been noted as a risk factor in some mining communities for example, heavy alcohol consumption by miners, as documented in the Democratic Republic of Congo’s artisanal mines, can impair judgment and coordination, thereby increasing accident rates (Elenge et al., 2013; Schulte et al., 2012). While specific data on alcohol or drug use in Kenyan mines is limited, anecdotal evidence suggests that some miners may use stimulants or alcohol to cope with the strenuous labor, inadvertently raising their injury risk (Kinyili, 2019).
- iii. Widespread environmental violations and impacts underscore the national significance of mining’s environmental problems. Official records from NEMA and the Ministry of Environment show numerous cases of mining-related environmental non-compliance. For instance, in 2025 NEMA inspectors issued cessation orders to several artisanal mining sites in Vihiga County after finding gross violations of environmental and safety regulations. The mines in question had dangerous open pits with cracking walls at risk of collapse and were operating without approved Environmental Management Plans. In addition to acute incidents (like tailings dam failures or landslides), there are chronic issues such as water pollution in mining regions. The Migori mercury study (2025) revealed a brewing environmental health crisis: water and soil near gold mining sites contained mercury

concentrations dozens of times above safe limits, suggesting that mining effluent and mercury amalgamation are contaminating streams and farmlands. At one river 6 km downstream of the mines, mercury was 30× the recommended limit in water samples. Such contamination poses long-term risks of neurological disease and ecosystem damage. Another study in Taita Taveta's gemstone mines documented siltation of rivers and heavy metal runoff, which has decimated aquatic life and made water unsafe for thousands of residents (Ministry of Environment, 2023). Air and noise pollution from blasting and crushing in quarries (e.g. around Nairobi and Kajiado) have led to community complaints of respiratory illnesses and hearing loss, indicating that environmental health standards are routinely breached. The national significance of these problems is clear: mining activities span many counties (from the coast, titanium and salt to the western gold belt, the central gemstone areas, and northeastern gypsum and coal prospects). Thus, the health and environmental hazards associated with mining potentially affect millions of Kenyan mine workers, their families, and communities near mining operations as well as the country's natural heritage.

In economic terms, the failure to address mine safety and environmental protection undermines sustainable development. Frequent accidents disrupt mineral production and impose healthcare costs, while environmental degradation from mining leads to loss of arable land, polluted water sources, and expensive restoration liabilities. A Ministry of Mining report (2022) noted that if current trends continue, the social and environmental costs of the mining sector could outweigh its financial benefits, especially in areas heavily reliant on agriculture and tourism which are affected by mining pollution. These findings underscore why mining health, safety, and environmental issues are national policy concerns. The extent of the problem measured in lives lost, injuries sustained, and ecosystems damaged calls for urgent and comprehensive regulatory action.

The proposed Mining (Mine Health, Safety and Environment) Regulations 2026 are a direct response to the gaps identified above in legislation, enforcement, and on-the-ground practices. More importantly, they seek to enhance mining socio-economic benefits, occupational health and safety, as well as environmental protection. They are justified as a necessary intervention to protect mine workers, communities, and the environment by addressing weaknesses in the current legal framework and its implementation:

- i. Closing Legislative Gaps: Kenya's previous mining legislation was outdated and fragmented, lacking dedicated provisions for modern health, safety, and environmental standards. The industry long operated under the old Mining Act of 1940 (Cap.306), which was "*Out of touch with current industry needs and international best practices.*" Although the Mining Act, 2016 modernized the sector's legal framework (repealing the 1940 law and related Acts), it largely defers worker safety and environmental protection to other laws requiring compliance with the Occupational Safety and Health Act, 2007 and Environmental Management and Coordination Act (EMCA) Cap. 387 of the Laws of Kenya but providing little sector-specific detail. This has left critical regulatory gaps. For example, general Occupational Safety and Health Act (OSHA), 2007 rules on workplace safety do not adequately cover mining-specific hazards like ground control, mine ventilation, explosives use, or tailings dam integrity. The 2026 Regulations will fill this gap by establishing mandatory mine-specific safety protocols (for drilling, blasting, support systems, emergency preparedness, etc.) and

- environmental standards tailored to mining operations (for waste management, pollution control, land reclamation, etc.). By doing so, the regulations operationalize the broad duties in the Mining Act, 2016 and EMCA Cap. 387 of the Laws of Kenya into clear requirements for mine operators. This will ensure that legislative intent (safe and healthy mining) is translated into practical rules on the ground.
- ii. **Strengthening Compliance and Enforcement:** A key justification for the new regulations is to remedy the weak enforcement mechanisms that have plagued the sector. The regulations will create a more robust monitoring and enforcement regime by delineating responsibilities and powers for oversight authorities. For instance, under the Mining Act 2016, the Directorate of Mines was established to regulate the sector, but enforcement has been hampered by a lack of regulations and resources. The 2026 Regulations propose to formalize inspection schedules, incident reporting requirements, sanctions for non-compliance, and coordination mechanisms among agencies. They will introduce mandatory safety audits and risk assessments for all medium and large-scale mines and require artisanal mining permit holders to undergo basic safety training and periodic inspections. Crucially, the regulations will ensure that every mine (large or small) has an approved Health and Safety Management Plan and an Environmental Management Plan, aligning with the best international practices. To support enforcement, the regulations envisage empowering inspectors of mines with clearer authority to issue improvement or prohibition notices when violations are found (analogous to approaches in countries like South Africa and Australia). This addresses the current situation where enforcement is inconsistent, as evidenced by the Auditor-General's finding that regional mines inspectors lacked sufficient technical staff and equipment to monitor operations. The new regulations, combined with parallel efforts to build capacity, will enable more regular mine inspections and a framework for penalties that deter negligence (e.g. fines, license suspensions, or prosecutions for serious breaches). In brief, they establish the backdrop needed to ensure compliance with safety and environmental standards, which has been missing under the patchwork of existing laws.
 - iii. **Enhancing Health and Safety:** The regulations directly tackle the unsafe conditions that have led to mining accidents and occupational diseases. They will set mandatory safety protocols such as requirements for mine roof support and slope stabilization (to prevent collapses), ventilation standards for underground mines (to prevent deadly gas build-ups and dust exposure), provision of proper PPE for all miners, limits on working hours in hazardous areas, and compulsory training programs for workers and managers on hazard awareness. Had such rules been enforceable earlier, many past accidents might have been prevented or mitigated. For example, the Siaya County tragedy where seven miners died due to ignored safety guidelines underscores the need for legally binding safety procedures in every mine. The regulations also call for establishing emergency response plans at mining sites including first aid facilities, rescue equipment, and protocols for mine rescue in collaboration with local authorities to reduce fatalities when accidents do occur. Overall, by instituting modern occupational health and safety standards, the 2026 Regulations aim to significantly reduce the current rate of mining injuries and fatalities. This is in line with international best practice: countries like

South Africa, after overhauling their mine safety laws (Mine Health and Safety Act, 1996), managed to cut annual mining fatalities to a record low (only 51 deaths in 2019 across hundreds of mines). Likewise, Australia and Canada have stringent mining OHS codes, resulting in far lower accident rates than those observed in Kenya. Adopting comparable protocols through these regulations will help move Kenya toward the global benchmark of “zero harm” in mining.

- iv. **Safeguarding the Environment:** Environmental protection is the third pillar of the proposed regulations. While EMCA Cap. 387 of the Laws of Kenya and its subsidiary legislation (e.g. EIA regulations) provide the general environmental framework, but enforcement in mining has been lax and uncoordinated. The 2026 Regulations justify themselves by instituting specific environmental safeguards for mining operations. These include: requiring detailed Environmental Impact Assessments and annual environmental audits for all mining projects (as already mandated by Section 176 of the Mining Act, 2016) setting standards for the management of mine waste (e.g. design and inspection of tailings storage facilities, treatment of effluents before discharge, safe disposal of hazardous waste like mercury-contaminated tailings); mandating progressive rehabilitation of mined land and reclamation of abandoned mine sites by operators; and creating monitoring protocols for water and air quality around mines, with obligations to report any pollution incidents promptly to NEMA and take remedial action. Such measures address the current regulatory gap where, for instance, there were no mine-specific rules on tailings dam construction, a serious omission given the risk of failures and toxic spills. By enforcing environmental standards at par with those in leading mining jurisdictions, the regulations will help prevent scenarios like the Migori mercury pollution crisis from recurring. Moreover, the regulations aim to establish a clearer compliance chain: they will formalize collaboration between the Directorate of Mines, NEMA, and county environmental officers for joint inspections and information-sharing. This inter-agency approach is designed so that environmental infractions by mines are swiftly detected and penalized (e.g. fines, cleanup orders, or suspension of mining licenses for egregious cases), closing the loopholes through which miners have hitherto operated with impunity. Ultimately, protecting the environment is not only a legal and constitutional mandate for Kenya it also ensures the mining sector’s sustainability and social license to operate. The new regulations will give effect to Article 42 of the Constitution (the right to a clean and healthy environment) by providing the background with enforcing environmental obligations in the mining context.
- v. **Learning from Comparator Countries:** The justification for these regulations is reinforced by benchmarking against mining regulatory regimes in countries with more mature mining sectors. South Africa provides a pertinent example: after the apartheid era of poor mine safety, the introduction of rigorous mine health and safety legislation (with provisions for mandatory risk assessments, mine health surveillance, independent inspections, and worker health & safety committees) led to a steady decline in mine accidents and occupational diseases. Kenya’s regulations draw on some of these best practices, such as requiring worker health surveillance (medical examinations) to detect diseases like silicosis early, and empowering workers to refuse unsafe work without

fear of retaliation provisions similar to those in South Africa's law. From Australia, the regulations borrow concepts like the requirement for each mine to have a detailed Mine Operations Plan covering safety management systems and environmental management ensuring companies plan for risk mitigation from project inception. Australian states (e.g. Western Australia) have successfully enforced such plans to achieve some of the world's lowest mining fatality rates. Canada offers models for balancing federal and provincial oversight, and for involving local communities in monitoring (through community environmental liaison committees for mines). The 2026 Regulations incorporate international standards (such as the IFC/World Bank EHS Guidelines for Mining and the ICMM, International Council on Mining & Metals best practice guides) to ensure Kenya's mining industry meets globally recognized safety and environmental performance levels. By referencing these comparators in the regulatory drafting process, Kenya is adopting proven measures suited to its context for instance, requiring *mine closure planning and financial bonding* (as done in Canada) to ensure that environmental rehabilitation is not neglected. The new regulations are justified not only by Kenya's current shortcomings, but by the positive outcomes observed in other countries that have implemented similar rules: improved worker safety, fewer environmental incidents, and a more accountable mining industry.

The Mining (Mine Health, Safety and Environment) Regulations 2026 are justified as a timely and necessary reform. They will fill the void in Kenya's mining governance by introducing enforceable standards and protocols that directly address the causes of accidents and pollution. This regulatory framework will bridge the gap between the goals of the Mining Act, 2016 and the reality on the ground, ultimately saving lives, protecting communities, and ensuring that mining contributes to sustainable development rather than undermining it. The cost of inaction, including mine disasters, occupational illnesses, and environmental damage, far outweighs the compliance costs of the new rules. These regulations represent a proactive step to align Kenya's mining practices with both its domestic legal obligations and international best practices, thereby securing the well-being of current and future generations in line with constitutional principles.

3.0 Statement on the Effect of the Proposed Regulations

The following are the effects of the proposed Mining (Mine Health, Safety and Environment) Regulations, 2026.

3.1 Effects on the Public Sector

The proposed Regulations will affect the Public Sector in the following ways:

1. **Strengthened Legal and Policy Framework:** The regulations build on the Mining Act, 2016, providing a clearer legal framework for public sector oversight. This empowers agencies to penalize non-compliant mining operations, fostering accountability but requiring robust legal support systems (Kenya Ministry of Mining, 2025).
2. **Enhanced Regulatory Oversight:** The Mining (Mine Health, Safety and Environment) Regulations, 2026, strengthen the role of the State Department for Mining by mandating stricter compliance with health, safety, and environmental standards. This requires public

sector bodies to allocate resources for inspections and monitoring, ensuring mining operations adhere to updated safety protocols (Kenya Ministry of Mining, 2025).

3. **Promotion of Sustainable Mining Practices:** The regulations align with EMCA Cap. 387 of the Laws of Kenya, pushing public sector agencies to prioritize sustainable development, reducing environmental degradation and promoting long-term ecological health (National Environment Management Authority, 2025).
4. **Improved Worker Safety Standards:** The regulations introduce stricter guidelines for occupational health and safety, compelling public sector agencies to collaborate with mining companies to ensure compliance with Personnel Protective Equipment (PPE) usage and workplace safety measures, reducing accidents and health risks (Kurantin, 2021).
5. **Increased Public Sector Accountability:** The regulations impose obligations on public sector agencies, such as NEMA, to enforce environmental protection measures, including mine site decommissioning and rehabilitation. This necessitates enhanced coordination among ministries to ensure sustainable mining practices (NEMA, 2025).
6. **Capacity Building and Training:** Public sector institutions are required to develop training programs for mining inspectors and environmental officers to enforce the 2026 regulations effectively. This includes educating personnel on new safety standards and environmental impact assessments, increasing operational costs but improving expertise (Igbayiloye & Bradlow, 2021).
7. **Environmental Protection and Community Engagement:** Public sector bodies must ensure mining companies consult with local communities and submit Social and Labour Plans, aligning with constitutional mandates for equitable resource sharing. This enhances public sector involvement in community engagement processes (Igbayiloye & Bradlow, 2021).
8. **Financial Implications for Public Sector:** Implementing the 2026 regulations requires increased budget allocations for monitoring, enforcement, and rehabilitation activities. Public sector agencies may face financial strain to meet these demands, necessitating efficient resource management (NEMA, 2025).

3.2 Effects on the Private Sector

The proposed Regulations will potentially affect the private sector in the following ways:

1. **Enhanced Occupational Health and Safety Standards:** The 2026 regulations prioritize the health and safety of miners, mandating stringent workplace safety protocols to reduce occupational risks. The mining industry in Kenya, which includes the extraction of minerals such as soda ash, gold, fluor spar, and gemstones, has historically been fraught with hazards such as cave-ins, exposure to toxic substances, and accidents (Utembe et al., 2015). The new regulations require private companies to implement comprehensive safety training programs, conduct regular safety audits, and ensure the use of protective equipment. This shift compels private firms to invest in advanced safety technologies and training, increasing operational costs but reducing the incidence of work-related injuries

and fatalities. Global studies on mining safety (Stemn et al., 2020) emphasize that a robust safety culture can minimize accidents, a goal that the regulations seek to achieve through mandatory compliance.

2. **Environmental Sustainability and Mine Closure Obligations:** A key component of the 2026 regulations is the emphasis on environmental protection and sustainable mine closure practices. The National Environment Management Authority (NEMA) underscores the need for ecological restoration post-mining to prevent environmental mutilation and ensure sustainable land use. Private mining companies are now required to develop and implement mine closure plans that align with environmental sustainability objectives, such as rehabilitating mined lands and mitigating pollution. Proper mine closure frameworks promote good governance and protect public health by eliminating adverse environmental effects (Nawino & Ojiambo, 2019). For private firms, this means increased financial commitments to EIAs, restoration projects, and compliance with NEMA's Draft National Guideline on Mine Site Decommissioning and Rehabilitation. While these obligations raise operational costs, they also enhance Corporate Social Responsibility (CSR) profiles, potentially attracting environmentally conscious investors. However, failure to comply could result in penalties or license revocations, posing financial risks to non-compliant firms (NEMA, 2025).
3. **Formalization of Artisanal and Small-Scale Mining (ASM):** The 2026 regulations build on the Mining Act, 2016, which recognizes ASM as a legal activity, and introduce specific health, safety, and environmental standards for this subsector. Previously, ASM in Kenya operated with minimal oversight, leading to unsafe practices and environmental degradation (OEM, 2018). The regulations now require private entities engaged in or collaborating with ASM to ensure compliance with safety protocols and environmental standards. The government has decriminalized artisanal mining and initiated formalization processes, which compel private companies to integrate ASM operations into their regulatory frameworks (Nyarangi, 2025). This formalization increases administrative burdens for private firms, as they must monitor and support ASM compliance, but it also creates opportunities for partnerships with local communities, fostering inclusive economic growth. For example, formalizing ASM can enhance supply chain transparency, appealing to global markets that prioritize ethical sourcing.
4. **Enhanced Community Engagement:** The regulations require private companies to invest in community engagement initiatives and transparent governance structures. Meaningful stakeholder engagement between mine owners, regulators, and communities enhances trust and reduces opposition to mining projects (Nawino & Ojiambo, 2019). For private firms, this translates into higher costs for community development programs but also mitigates risks of social conflicts that could disrupt operations.
5. **Innovation and Technological Advancements:** The regulations incentivize private companies to adopt cleaner and safer technologies. A global study by Cambridge University Press in 2022 indicated that stricter environmental regulations correlate with increased patenting activities in clean mining technologies, with a 1% increase in environmental policy stringency leading to a 0.3–0.45% rise in clean patents. In Kenya, private firms are likely to invest in energy-efficient equipment, water-saving technologies, and waste management systems to comply with the regulations. These investments enhance long-term productivity and reduce environmental liabilities, aligning with global trends toward sustainable mining practices (Cambridge University Press, 2022).

3.3 Effects on Fundamental Rights and Freedoms

The proposed Regulations may affect the fundamental rights and freedoms of individuals and players in the following ways.

i. Inherent dignity

Article 28 of the Constitution provides that all persons have inherent dignity and for that dignity to be respected and protected. The proposed Regulations respect and protect that dignity by acknowledging the big risks that are associated with working in mines and ensuring that persons working in mines are safe. An example is regulation 21 which requires that employees in a mine are provided with information, training and instruction before working in a mine. This is also required under section 24 which requires that third parties and visitors to the mine are also adequately informed.

ii. Right to privacy

Article 31 of the Constitution provides that all persons are entitled to privacy. Under regulation 35 (2) of the proposed regulations, a mineral rights holder shall not disclose the health monitoring report of an employee without the employee's written consent. The mineral rights holder is required to comply with data protection laws to ensure the protection of privacy.

iii. Access to information

Article 35 of the Constitution guarantees the right of access to information. For instance, regulation 96 requires that a mineral right holder undertake a comprehensive risk assessment for all phases of the mine cycle, covering the likelihood and impact of potential risks and hazards and maintain a risk register. The risk register is to be updated at least once every quarter and be available for inspection upon request by the Ministry. The keeping of records enhances the right of access to information which the public is entitled to request from any person under Article 35 (1) (b) of the Constitution.

iv. Fair labour practice

Article 41 guarantees that all workers have the right to fair labour practices, which includes the right to reasonable working conditions. The proposed regulations under parts II, III, V and VI are intended to address the health and safety of workers. For instance, regulations 12, 16, 21 and 23 of the proposed regulations require that employees be provided with safety instructions and inductions prior to working in the mines. Regulation 27 requires the provision of personal protective equipment to persons working in a mine. These provisions are intended to ensure that working conditions are safe in accordance with Article 41.

v. Right to a clean and healthy environment

Article 42 provides that all persons have the right to a clean and healthy environment which includes the right to have the environment protected for the benefit of present and future generations. Recognizing that mining activities can be detrimental to the environment, the

regulations seek to address this by placing the responsibility on mining right holders to conduct activities in a manner that has least impact on the environment. For instance, under regulation 137, prior to the closure of a mine, the right holder is required to undertake an inspection on water quality and quantity after mining operations, air quality, waste management, ground stability following explosions, soil quality and status of biodiversity in the operations area. This is intended to ensure accountability and encourage preservation of the environment.

vi. Right to the highest attainable standard to health

Article 43 provides that all persons are entitled to the highest attainable standard to health. For instance, regulation 32 of the proposed regulations requires that a mineral rights holder shall prepare and implement a health management plan for the mine, identifying possible risks and control measures proposed to manage such risks. This is intended to ensure that Article 43 of the Constitution is adhered to.

vii. Right to goods and services of reasonable quality

Article 46 provides that consumers have a right to goods and services of reasonable quality, information and protection of their health and safety. This is addressed, for instance, in regulation 23 of the proposed regulations, which requires that any third parties visiting a mining area shall be provided with information about the risks, safety and health precautions and actions to be taken in the event of an emergency.

viii. Right to fair administrative action

Article 47 of the Constitution provides that all persons have the right to fair administrative action. For instance, regulation 85 of the proposed regulations requires a mineral rights holder to submit a plan for a tailing's storage facility to the Secretary of Mines for approval. The Secretary of Mines shall issue a written decision either approving or rejecting the plan, in line with Article 47.

4.0 Statement on Regulatory & Non-Regulatory Options

This section highlights other regulatory and non-regulatory options that may be adopted to achieve the same intended objectives of Kenya's Mining (Mine Health, Safety and Environment) Regulations, 2026.

4.1 Option 1: Maintaining the *Status Quo*

Before considering new interventions, it is important to consider whether the problem could be resolved by making changes to practices within the existing regulatory framework, thus maintaining the status quo. Examples of this are:

- i. Making use of existing laws, regulations and/or guidelines
- ii. Simplifying or clarifying existing regulations
- iii. Improving compliance and enforcement of existing regulations
- iv. Making legal remedies more accessible or cheaper

The Mining Act, 2016 recognized the need to integrate health, safety, and environmental considerations: Section 176 of the Act stipulates that mining license holders must comply with all

environmental protection laws, and it prohibits granting of a mining license without an approved Environmental Impact Assessment (EIA) license and Environmental Management Plan. Similarly, the Act mandates that mine operators adhere to occupational health and safety requirements as per existing labor safety legislation. Despite these clauses, the Act itself did not spell out detailed HSE regulations, instead empowering the Cabinet Secretary for Mining to promulgate specific rules. Over the last decade, several regulations were issued under the Act, e.g. on licensing, royalties, local content, and dealings in minerals, but dedicated Mine Health, Safety, and Environment regulations were not passed, leaving a regulatory gap that the 2026 Regulations now seek to fill. Therefore, maintaining the status quo would leave the Mining sector in its current state with an ineffective regulatory framework.

4.2 Option 2: Passing the Regulations

The Government can achieve its policy objectives by utilising taxpayers' money or through a range of non-spending interventions, including regulation. The regulatory option of passing the Mining (Mine Health, Safety and Environment) Regulations, 2026 will represent a significant stride towards enhancing Occupational Health and Safety (OHS) standards, environmental stewardship, and community welfare within the mining sector. This initiative aligns with both national legislative frameworks and international conventions, aiming to address longstanding challenges in the industry.

Adoption and operationalization of the proposed Regulations will translate to the following:

- i. Enhancement of health and safety standards within the mining sector, fostering safer working environments and reducing workplace accidents. This, in turn, will enhance the well-being and productivity of miners
- ii. Mitigating negative ecological effects of mining activities, including land degradation and water pollution
- iii. Strengthen compliance with both national and international mining standards, boosting investor confidence in Kenya's mining industry
- iv. Improvement in safety practices reducing the frequency and severity of mining-related injuries and fatalities
- v. Encourage the adoption of modern mining technologies and best practices, promoting efficiency and sustainability in the sector
- vi. Improved environmental management and reduced negative impacts of mining, such as air and noise pollution among others
- vii. Establishment of robust monitoring and reporting frameworks ensuring effective oversight of mining operations, leading to better regulatory compliance
- viii. Promotion of skills development and capacity building in occupational health and safety management within the mining workforce
- ix. Sustainable growth and development of Kenya's mining sector, positioning it as a key driver of economic development while safeguarding environmental and social interests.

4.3 Option 3: Other Practical Options

Other practical options can complement or, in some cases, serve as alternatives to achieve similar objectives as the Mining (Mine Health, Safety and Environment) Regulations, 2026. These approaches emphasize voluntary initiatives, community engagement, technological innovation,

and industry-led standards that foster safer and more environmentally responsible mining practices without relying solely on mandatory legal frameworks. By integrating these strategies, Kenya's mining sector can effectively address health, safety, and environmental challenges, even in the absence of stringent regulatory enforcement.

Alternatives to regulation include:

- i. **No new intervention/do nothing:** This may include making use of existing laws (or none) and regulations, simplifying or clarifying existing laws and regulations, improving enforcement of existing laws and regulations, or making legal remedies more accessible or cheaper.
- ii. **Adoption of Industry-Led Voluntary Standards and Certifications:** Mining companies can align with international frameworks for environmental management, such as the International Council on Mining and Metals (ICMM) Sustainable Development Framework or ISO 14001. These frameworks encourage companies to implement best practices in health, safety, and environmental management voluntarily. For instance, certifications can incentivize mining firms to adopt safer operational practices and reduce environmental impacts through internal audits and transparent reporting.
- iii. **Community Engagement and Stakeholder Collaboration:** Engaging local communities and stakeholders is a critical non-regulatory strategy to promote health, safety, and environmental sustainability. Mining operations often impact surrounding communities, leading to conflicts over land use and environmental degradation. Collaborative initiatives, such as Community Development Agreements (CDAs), can ensure that mining companies address community concerns, including health and safety risks. Inclusive community engagement can mitigate conflicts and foster mutually beneficial relationships between mining companies and local populations (Luning & Rajak, 2011). In Kenya, where mining is a key economic driver in regions like East Africa, platforms like MINEXPO Kenya provide opportunities for stakeholders to collaborate, share innovative safety equipment, and promote sustainable practices (Expogr, n.d.).
- iv. **Adoption of Best Available Technologies (BATs) and Practices:** The use of Best Available Technologies (BATs) and Best Applicable Practices (BAPs) enhance mine safety and environmental protection. Technologies such as advanced monitoring systems for air, soil, and water pollution can help mining companies proactively address environmental risks. Integrating geochemical and environmental considerations is crucial into mine tailings management to mitigate toxicity risks (Ccorimanya & Huaraca, 2023). In Kenya, adopting such technologies could reduce the environmental footprint of mining operations, particularly in sensitive ecological areas. Additionally, best practices such as proper tailings storage facility management can prevent accidents, aligning with the objectives of the regulations without mandatory enforcement.

- v. **Capacity Building and Training Programs:** Investing in capacity building and training for workers and management is aimed at improving health and safety outcomes. Training programs focused on occupational safety, hazard identification, and emergency response can empower workers to mitigate risks effectively. In Kenya, where occupational health and safety challenges persist, such initiatives are critical. Addressing psychosocial hazards and fostering a safety culture through training in the workplace (Ndeda et al. 2024). Additionally, training programs can be extended to local communities to raise awareness about environmental conservation, further supporting sustainability objectives.
- vi. **Corporate Social Responsibility (CSR) Initiatives:** These serve as avenues to address health, safety, and environmental concerns. Mining companies can invest in community health programs, reforestation projects, or water treatment facilities to mitigate the impact of their operations. In Kenya, where mining contributes significantly to economic growth, CSR initiatives can address issues such as silicosis or noise-induced hearing loss, which are prevalent in the sector (Smith et al., 2025).
- vii. **Research and Knowledge Sharing:** Collaborative research between mining companies, universities, and research institutions can identify innovative solutions to sector-specific challenges. In Kenya, partnerships with organizations such as Kenya Institute for Public Policy Research and Analysis (KIPPRA) can facilitate data-driven strategies to improve workplace safety (KIPPRA, 2021). Knowledge-sharing platforms, such as MINEXPO Kenya, also enable industry professionals to exchange ideas on safety equipment and sustainable technologies, fostering a culture of continuous improvement.

4.4 Alternatives to regulation

Alternative regulation models can achieve similar objectives as the Mining (Mine Health, Safety and Environment) Regulations, 2026 by leveraging innovative governance frameworks, stakeholder engagement, and technology-driven approaches. These models emphasize stakeholder collaboration, flexibility, adaptability, economic incentives, and technological innovation, addressing the unique challenges of Kenya's mining sector, including artisanal mining and environmental degradation. Alternative regulation models will include Co-regulation, Performance-Based Regulation (PBR), Resilience-Based Regulation, Incentive-Based Regulation and Technology-Driven Regulation.

i. Co-regulation

This model involves collaboration between government, industry, and communities to develop and enforce standards. Unlike top-down regulatory approaches, co-regulation emphasizes shared responsibility, allowing stakeholders to tailor solutions to local contexts. For instance, in South Africa, mining governance has incorporated community representation through traditional leaders and not-for-profit companies, fostering dialogue between mining companies and affected communities (Green & Norberg, 2018). This model could be adapted in Kenya to ensure that local communities, particularly in mining regions have a voice in shaping health and safety standards.

Co-regulation encourages accountability and builds trust, which is critical in addressing social and environmental impacts (Jamali, 2008).

ii. Performance-Based Regulation (PBR)

This model focuses on outcomes rather than prescriptive rules, allowing mining companies flexibility in how they achieve health, safety, and environmental goals. This model is effective in mining, where technological advancements can outpace rigid regulations. A study on occupational health and safety in mining highlights that PBR encourages companies to innovate in safety measures, such as adopting advanced monitoring technologies to reduce workplace accidents (Prescott et al., 2022). Performance-Based Regulation could incentivize companies to implement real-time air quality monitoring or automated safety systems, addressing risks such as mercury contamination from artisanal mining (Prescott et al., 2022).

iii. Resilience-Based Regulation

This model emphasises adaptability to uncertainties, such as environmental disasters or health crises, which are prevalent in mining. This model integrates safety, reliability, and robustness into regulatory frameworks, as discussed in safety science literature (Haavik, 2014). In Kenya, where artisanal and small-scale gold mining (ASGM) contributes to environmental degradation and health risks like mercury poisoning, resilience-based approaches could involve adaptive management plans. These plans would require mining operators to develop contingency measures for environmental shocks, such as spills or land degradation, while ensuring worker safety through regular training (Prescott et al., 2022).

iv. Incentive-Based Regulation

This model uses economic tools, such as tax breaks or subsidies, to encourage compliance with health, safety, and environmental standards. A review of mining's social impacts suggests that positive incentives such as financial rewards for reducing emissions or improving worker welfare, can enhance industry performance (ScienceDirect, n.d.). In Kenya, where mining contributes significantly to the economy, offering incentives for adopting eco-friendly technologies or safer work practices could drive compliance. For example, tax rebates for companies that eliminate mercury use in ASGM could align with global commitments like the Minamata Convention (Prescott et al., 2022). This model complements the regulations by promoting voluntary adoption of best practices.

v. Technology-Driven Regulation

This model leverages innovations like the Internet of Things (IoT) and Big Data Analytics (BDA) to monitor and enforce compliance. A systematic review of supply chain decision-making highlights how IoT can track environmental and safety metrics in real time, improving accountability (ScienceDirect, n.d.). Integrating IoT sensors to monitor air quality, water contamination, or worker exposure to hazards could enhance regulatory oversight. For instance, real-time data on mercury levels in rivers near mining sites could trigger immediate remediation

actions, protecting both the environment and community health (Prescott et al., 2022). This model supports the regulations' goals by providing scalable, data-driven solutions.

5.0 Cost-Benefit Analysis (CBA)

This section analyses the economic, environmental, and social impacts, as well as the administrative and compliance costs, of adopting the proposed Regulations. It also assesses and quantifies the proposed regulations' return on investment and how the impact is likely to be distributed between the public and private sectors.

5.1 Economic Impacts of the Proposed Regulations

The economic impact of the proposed regulations are outlined below.

5.1.1 Anticipated economic benefits and cost

The anticipated economic benefits and cost are examined at three levels; Micro (mining industry level) Meso (consumers and other auxiliary stakeholders) and Macro (national and international level).

5.1.1.1 Micro (mining industry level)

Benefits

The economic benefits will include;

- i. **Reduced accidents and fatalities:** The implementation of rigorous health and safety protocols such as mandatory use of personal protective equipment (PPE), improved emergency response plans, and regular safety audits will significantly reduce the occurrence of mining accidents and fatalities. This not only protects workers' lives but also minimizes production stoppages due to accidents and reduces the legal and compensation liabilities of mining companies. Fewer workplace incidents also translate to lower insurance costs and reduced absenteeism.
- ii. **Enhanced Worker Productivity and Morale:** By prioritizing worker safety and health, mining companies create a more supportive and secure working environment. Workers who feel safe and valued tend to be more motivated, leading to improved productivity and better retention of skilled labor. Healthier workers also have fewer sick days, contributing to operational stability and efficiency. This can foster a positive workplace culture and higher job satisfaction across the mining sector.
- iii. **Environmental Protection and Sustainability:** The regulations require mining companies to develop and implement robust environmental management plans, conduct periodic environmental audits, and rehabilitate mined-out areas. This helps minimize environmental degradation, conserve biodiversity, and maintain ecosystem services such as water purification and soil fertility. In the long run, this promotes sustainable land use and reduces the negative impacts of mining on climate change and community livelihoods.
- iv. **Enhanced International Competitiveness:** Compliance with internationally recognized standards for occupational health, safety, and environmental sustainability boosts the reputation of Kenya's mining sector on the global stage. This can attract responsible foreign investors and international buyers who prioritize sourcing minerals from countries with strong environmental and safety practices. It also aligns Kenya's mining industry with global standards opening doors to export markets and trade agreements.

- v. **Local Economic Development and Job Creation:** The new regulations create a market for environmental and safety services, such as environmental audits, health and safety training, and monitoring technologies. This generates employment opportunities for local businesses providing these services, spurring the growth of auxiliary industries. Local suppliers of PPE, safety equipment, and environmental management tools will also benefit from increased demand.
- vi. **Long-Term Economic Stability and Resilience:** By reducing the environmental footprint of mining and promoting social responsibility, these regulations help ensure that mining remains a viable and accepted economic activity in Kenya. This supports the sector's contribution to GDP and government revenues through taxes and royalties. A stable, well-regulated mining sector can provide consistent foreign exchange earnings and contribute to infrastructure development in mining regions, supporting national economic resilience.

Costs

The economic costs will include

- i. **Compliance Costs:** Implementation of safety and environmental management systems requires significant investment in infrastructure, equipment (like PPE), and training.
- ii. **Administrative Costs:** Increased paperwork, inspections, and reporting may add to operational overheads.
- iii. **Potential Temporary Disruptions:** Upgrading to new safety or environmental standards may cause temporary disruptions to production.
- iv. **Capital Expenditure on Equipment and Infrastructure:** To meet the new safety and environmental standards, mining companies may need to invest heavily in upgrading or replacing equipment. This may also include retrofitting existing mining facilities to comply with updated environmental requirements.
- v. **Loss of Economies of Scale for Smaller Operators:** Small-scale mining operators might struggle to meet the new standards cost-effectively. Compliance costs can be proportionately higher for smaller firms compared to larger mining houses, potentially making some small operations economically unviable.
- vi. **Legal and Consultancy Fees:** Navigating the complexities of the new regulations may require mining companies to hire legal and environmental consultants to help them interpret and comply with the rules. This adds an extra layer of cost, especially during the initial adjustment phase.
- vii. **Costs of Environmental Rehabilitation and Monitoring:** The requirement to rehabilitate mined-out areas and conduct regular environmental monitoring adds an ongoing operational cost. These activities may not generate immediate revenue but are mandatory under the new framework.

5.1.1.2 Meso (Consumers and other auxiliary stakeholders)

Benefits

The economic benefits will include;

- i. **Safer Products and Processes for Downstream Users:** Stricter health and safety standards in mining help ensure that minerals and raw materials are extracted and processed under conditions that minimize contamination and safety risks. This benefits downstream industries such as construction, manufacturing, and energy by providing higher-quality, safer inputs among others.
- ii. **Expanded Local Business Opportunities:** The regulations create demand for a range of services and supplies, including: PPE manufacturers, environmental consultants, waste management service, safety training providers. This creates new revenue streams for local businesses, diversifying the economy beyond just mining itself.
- iii. **Improved Health Outcomes for Nearby Communities:** Better environmental management leads to reduced air and water pollution in communities surrounding mining operations. This improves public health, reducing incidences of respiratory and waterborne diseases, and lowers healthcare costs for local governments and families.
- iv. **Enhanced Social License to Operate:** The regulations require mining companies to engage more actively with local communities. Mechanisms for consultation and grievance redress build trust and reduce conflicts between communities and miners. This can lead to more stable community-mining relationships, benefiting both sides.
- v. **Job Creation in Support Services:** The demand for new safety and environmental practices creates jobs in sectors like waste management, environmental monitoring, and health and safety training. These support jobs are often filled by local workers, providing employment opportunities beyond mine itself.

Costs

The economic costs will include;

- i. **Higher Prices for Products:** Mining companies' increased compliance costs, such as safety equipment and environmental management, may be passed on to downstream consumers through higher prices for minerals and mineral-based products. Industries relying on these resources such as cement, construction, and jewelry might face higher input costs.
- ii. **Disruption of Supply Chains:** During the transition to new regulations, some mining operations may temporarily slow down or halt production to meet new safety and environmental requirements. This can disrupt the supply of minerals, affecting industries dependent on continuous mineral supply.
- iii. **Adjustment Costs for Local Suppliers:** Local businesses supplying goods and services to mining operations may need to adjust their operations to align with the new safety and environmental standards. This could involve costly investments in training, certifications, or upgraded equipment.
- iv. **Potential Short-Term Job Losses:** If some smaller mining operators are unable to comply and close down, workers in these operations and auxiliary workers in local services that support them may lose their jobs in the short term. This creates a temporary economic strain on affected communities.
- v. **Increased Administrative and Compliance Burden:** Community and stakeholder groups that engage with mining companies such as local development committees and civil society organizations may need to invest more time and resources into understanding and monitoring these new standards, adding to their workloads and costs.

5.1.1.3 Macro (National and international level)

Benefits

The economic benefits will include;

- i. **Strengthened Economic Stability and Growth:** By promoting safer, healthier, and environmentally responsible mining, these regulations help ensure that the mining sector remains a viable, long-term contributor to Kenya's GDP. Stable mining operations mean more consistent revenue for the government through royalties, taxes, and licensing fees.
- ii. **Increased Foreign Direct Investment (FDI):** International investors are more likely to invest in countries with clear and robust regulatory frameworks that protect worker safety and environmental sustainability. Kenya's improved regulatory landscape can attract responsible, long-term investments, boosting the national economy.
- iii. **Compliance with Global Standards and Trade Agreements:** The new regulations align Kenya's mining sector with international labor and environmental standards. This facilitates access to international markets and trade partnerships, enhancing Kenya's global competitiveness in mineral exports.
- iv. **Enhanced Environmental Stewardship:** Nationally, the regulations ensure that mining activities contribute to Kenya's environmental sustainability goals, such as preserving biodiversity, protecting water sources, and reducing carbon emissions. This supports the country's obligations under international environmental agreements and helps mitigate climate change impacts.
- v. **Socioeconomic Development in Mining Regions:** A well-regulated mining sector can drive infrastructure development such as roads, water systems and power in mining areas, spurring broader economic growth. This fosters balanced regional development and helps reduce poverty in historically underdeveloped mining communities.
- vi. **Global Supply Chain Role:** Kenya could position itself as a supplier of critical minerals such as lithium, cobalt among others for the global energy transition, attracting international investment and strengthening trade ties with markets like the EU and U.S.

Costs

The economic costs will include;

- i. **Fiscal and Debt Risks:** Implementing 2026 regulations may require public investment in enforcement and monitoring, straining Kenya's fiscal deficit (projected at 5.0% of GDP in 2025). Failure to achieve fiscal consolidation could exacerbate debt vulnerabilities.
- ii. **Environmental Degradation:** Large-scale mining could lead to deforestation, biodiversity loss, and water resource depletion, incurring long-term economic costs for national climate resilience and adaptation efforts.
- iii. **Global Market Dependence:** Reliance on volatile global commodity markets could expose Kenya to economic shocks, especially if China's slowing economy reduces demand.

- iv. Trade and Geopolitical Risks: International trade uncertainties and regional instability could disrupt mining exports, impacting national revenue and global market positioning.

5.2 Social Impacts of the Proposed Regulations

The Regulations are expected to have the following social impacts.

5.2.1 Social benefits

The anticipated social benefits of the proposed Regulations are:

- i. Safety, health, and welfare of persons employed in mines: The regulations aim to ensure that workers in mining operations are protected through safe working conditions, access to health services, and welfare provisions. This includes proper training, equipment, and protocols to minimize workplace accidents and occupational hazards.
- ii. Protection of persons outside the operation area: The regulations seek to safeguard communities and individuals near mining sites from risks such as environmental pollution, noise, or accidents caused by mining activities, ensuring their safety and health are not compromised.
- iii. Right to a safe and healthy environment: By enforcing measures that reduce environmental and health risks, the regulations uphold the constitutional right of mine workers and nearby residents to a safe and healthy environment, addressing issues like air and water pollution or land degradation.
- iv. Standard guidelines on mine health and safety: The regulations provide clear, standardized protocols for health and safety practices in mining, ensuring consistency across operations and enabling easier compliance and enforcement.
- v. Promotion of a culture of accountability: By establishing policies and guidelines, the regulations encourage mining companies to take responsibility for maintaining safety and health standards, fostering proactive risk management and transparent reporting.
- vi. Safety standards in exploration and mine areas: Specific safety protocols will be enforced in exploration and active mining zones to prevent accidents, such as cave-ins or equipment failures, protecting workers and others in these areas.
- vii. Compliance with the Data Protection Act (CAP 411C): The regulations ensure that personal data of workers and stakeholders collected during mining operations is handled securely and in accordance with Kenya's Data Protection Act, protecting privacy rights.
- viii. Compliance with the Work Injury Benefits Act (CAP 236): The regulations align with Kenya's Work Injury Benefits Act, ensuring that workers injured on the job receive appropriate compensation and medical care, promoting fairness and support for affected employees.
- ix. Provision of geotechnical investigations: The regulations mandate geotechnical studies to assess the stability and safety of mining sites, reducing risks like landslides or structural failures that could endanger workers or nearby communities.
- x. Inspection of the mining site: Regular inspections will be required to verify the overall stability and safety of the mine, ensuring ongoing compliance with safety standards and early detection of potential hazards.

- xi. Proper handling and management of explosives: The regulations outline strict guidelines for the storage, transport, and use of explosives in mining to prevent accidents and ensure safe handling practices.
- xii. Provision of requirements for blasting operations: Specific rules for blasting activities will be enforced to minimize risks such as flying debris, vibrations, or noise pollution, protecting both workers and surrounding areas.

These measures collectively aim to enhance safety, protect health, and promote responsible mining practices for the benefit of workers, communities, and the environment.

5.2.2 Social Costs

The anticipated social costs of the proposed Regulations are;

- i. Compliance costs raising prices of mined goods: Stricter regulations increase operational expenses (e.g., safety measures, environmental controls), which may lead to higher prices for metals and minerals. This can indirectly raise costs for consumer products like electronics or construction materials, impacting affordability.
- ii. Increased operational costs leading to mine closures or reduced hiring: The financial burden of compliance, such as investing in new equipment or processes, may force some mines to close or scale back operations, reducing job opportunities and affecting local employment, particularly in mining-dependent communities.
- iii. Relocation due to buffer zones or environmental protections: Regulations mandating buffer zones or environmental safeguards may require relocating nearby communities, disrupting their livelihoods, social structures, and cultural connections to ancestral lands.
- iv. Favoring large companies over small-scale miners: Compliance with complex regulations often requires significant resources, which large companies can afford, while small-scale or artisanal miners may struggle, leading to economic exclusion and increased inequality in the mining sector.
- v. Disputes over land use or reclamation priorities: Regulations prioritizing environmental protection (e.g., conserving endangered species) may conflict with community needs, such as agricultural land use, leading to tensions or disputes among stakeholders over resource allocation.
- vi. Reduced budgets for community development: Funds diverted to meet environmental compliance requirements, such as tailings management or pollution monitoring, may limit investments in community programs like schools, healthcare, or infrastructure, hindering local development.
- vii. Remediation altering historical or archaeological sites: Environmental remediation efforts, such as land restoration, may alter or destroy mining sites with historical or archaeological significance, erasing cultural heritage valued by communities.
- viii. Restricted access to culturally significant areas: Regulations protecting environmentally sensitive sites may limit indigenous groups' access to areas of cultural or spiritual importance, potentially straining relations and eroding cultural practices.
- ix. Overdependence on mining hinders economic diversification: Strict regulations may reinforce reliance on mining by focusing resources on compliance rather than

supporting alternative industries, limiting the development of diverse, resilient local economies.

These social costs highlight the potential trade-offs of the regulations, balancing safety and environmental goals against economic, cultural, and community impacts.

5.3 Environmental Impacts of the Proposed Regulations

The Regulations are expected to have the following environmental impacts.

5.3.1 Environmental benefits

The anticipated environmental benefits of the proposed Regulations are:

- i. Effective monitoring of safety, environmental, and health conditions: The regulations establish systems to continuously monitor environmental impacts, safety risks, and health conditions at mines, ensuring timely detection and mitigation of issues like pollution or hazardous exposures.
- ii. Enforcement of safety, environmental safeguards, and health measures: Strict enforcement mechanisms ensure compliance with environmental standards, safety protocols, and health measures, reducing risks to ecosystems and workers through consistent oversight.
- iii. Environmental safeguards in exploration and exploitation: The regulations mandate protective measures during mineral exploration and extraction, such as minimizing habitat disruption or pollution, to preserve ecosystems.
- iv. Promotion of research and cooperation: The regulations encourage collaboration and research to improve safety, health, and environmental practices in mining, fostering innovation and knowledge-sharing for sustainable operations.
- v. Geotechnical survey prior to site development: Conducting geotechnical surveys before mining begins helps assess site stability and environmental risks, preventing issues like landslides or groundwater contamination.
- vi. Geotechnical investigations during mining: Ongoing geotechnical studies during operations ensure the mine remains structurally sound, reducing environmental damage from collapses or erosion.
- vii. Proper management of oil: The regulations require safe handling, storage, and disposal of oils used in mining to prevent spills that could contaminate soil or water sources.
- viii. Proper management of exhaust steam: Guidelines for managing exhaust steam from mining processes aim to minimize air pollution and thermal impacts on surrounding ecosystems.
- ix. Requirements for blasting operations: Specific rules for blasting reduce environmental harm by controlling vibrations, dust, and noise, protecting nearby ecosystems and communities.
- x. Safe handling and management of tailings: The regulations enforce secure storage and treatment of tailings (mining waste) to prevent contamination of water bodies or soil, safeguarding the environment.
- xi. Procedure for reprocessing tailings: Guidelines for reprocessing tailings ensure that waste is treated or reused in ways that minimize environmental pollution, reducing long-term ecological impacts.

- xii. Risk assessment of the mining site: Regular risk assessments identify potential environmental hazards, enabling proactive measures to mitigate issues like spills or habitat destruction.
- xiii. Management of storm water: Proper storm water management systems prevent runoff from carrying pollutants into nearby water sources, protecting local ecosystems and communities.
- xiv. Preparation of a mine site plan: A detailed site plan identifies critical infrastructure and ecologically sensitive areas, ensuring their protection through targeted management strategies.
- xv. Guidelines on slope excavation dimensions: Standardized excavation guidelines prevent unstable slopes, reducing risks of landslides or erosion that could harm the environment.
- xvi. Sustainable water supply management plan: The regulations require plans to minimize water use and protect natural water systems, ensuring mining operations do not deplete or contaminate local water resources.
- xvii. Mechanisms to monitor and suppress dust levels: Technologies and practices to control dust emissions ensure compliance with air quality laws, reducing respiratory and environmental impacts.
- xviii. Management of noise levels: Regulations set noise limits to minimize disturbances to wildlife and communities, preserving ecological balance and quality of life.
- xix. Leach management: Proper management of leachates (liquids from mining processes) prevents contamination of soil and water, protecting ecosystems and groundwater.
- xx. Proper management of mine waste: Comprehensive waste management protocols ensure safe disposal or recycling of mine waste, reducing environmental pollution and land degradation.

These environmental benefits aim to balance mining activities with ecological preservation, ensuring sustainable practices that protect natural systems and surrounding communities.

5.3.2 Environmental costs

The anticipated environmental costs of the proposed Regulations are;

- i. Non-compliance leading to pollution, land degradation, and unmitigated environmental damage: If mining companies fail to adhere to regulations, activities like improper waste disposal or unchecked emissions can cause pollution, degrade land, and lead to long-term environmental harm, such as contaminated soils or water bodies.
- ii. Environmental degradation from small-scale mining: Small-scale or artisanal mining, often unregulated, can cause deforestation, river siltation, and soil erosion due to a lack of environmental safeguards, damaging ecosystems and reducing land productivity.
- iii. Delayed or incomplete land rehabilitation: Open pits, contaminated land, and degraded ecosystems may persist if rehabilitation is delayed or underfunded, posing risks to human health (e.g., exposure to toxins) and hindering ecosystem recovery.
- iv. Water pollution from tailings and toxic runoff: Increased tailings from detoxifying processes, along with toxic runoff, sedimentation, and heavy metal contamination, can pollute rivers, lakes, and groundwater, threatening aquatic life and human water supplies.

- v. **Habitat destruction and species displacement:** Reclamation activities, such as land reshaping or vegetation removal, may destroy habitats, displacing wildlife and disrupting biodiversity, with long-term ecological consequences.
- vi. **Increase in air and noise pollution:** Mining operations can generate airborne particulate matter and noise, causing respiratory issues for nearby communities and disturbing wildlife, potentially altering animal behaviour or migration patterns.
- vii. **Environmental stress from declining groundwater and regional pollution:** Overuse of water in mining can lower groundwater levels, while regional pollution from mining activities (e.g., dust or chemical spills) adds stress to ecosystems, affecting water availability and quality.

These environmental costs highlight the challenges of enforcing regulations and the potential consequences of non-compliance or inadequate implementation, which could exacerbate ecological damage and affect human and environmental health.

5.4 Quantification of the Benefits

The proposed Regulations aim to enhance safety, health, and environmental sustainability in the mining sector, aligning with the Mining Act, 2016, and the National Environment Management Authority's (NEMA) guidelines. This cost-benefit analysis (CBA) quantifies the anticipated benefits and costs of these regulations at the micro (mining industry), meso (consumers and auxiliary stakeholders), and macro (national and international) levels, calculating a cost-benefit ratio (BCR) to assess their economic viability.

The CBA quantifies benefits and costs using parameters derived from literature and Kenyan mining data. Benefits include economic growth, health and safety improvements, environmental savings, and social development, while costs encompass compliance, enforcement, and transition expenses. The BCR is calculated as:

- A $BCR > 1$ indicates that benefits outweigh costs. Costs and benefits are annualized and discounted at a 7% rate, per Kenyan CBA standards.

5.4.1 Micro-Level (Mining Industry)

Benefits:

1. Increased Investment and Productivity:

- i. **Parameter:** Annual investment in mining exploration and production.
- ii. **Quantification:** If current investment is KES 65 Billion annually, a 20% increase adds KES 13 Billion. Productivity gains from technology could save KES 3 – 4 Billion annually for 10 major projects.
- iii. **Source:** Bowmans - Kenya Mining Outlook 2023.

2. Reduced Accident Costs:

- i. **Parameter:** Costs of workplace accidents (medical expenses, downtime).
- ii. **Quantification:** Regulations could reduce accidents by 20 - 30%, based on enforcement of safety environmental safeguards and health measures. If current accident costs are 6 Billion annually, savings could be KES 1 – 2 Billion.
- iii. **Source:** OSHA Technical Manual (OTM) - Occupational Safety and Health Administration

3. Improved Worker Productivity:

- i. **Parameter:** Labor efficiency gains from better health.
- ii. **Quantification:** A 5 - 10% productivity increase could save KES 650 Million – 1 Billion annually, assuming labor costs of 13 Billion.
- iii. **Source:** Humphreys, 2020

Costs:

1. Compliance Costs:

- i. **Parameter:** Costs for safety equipment, training, and environmental measures.
- ii. **Quantification:** Assume KES 130 Million per company for 50 companies, totaling 7 Billion annually.

2. Transition Costs:

- i. **Parameter:** Temporary output reduction during adaptation.
- ii. **Quantification:** A 5% output reduction could cost KES 3 Billion annually for 2 years, based on KES 65 Billion output.

CBA Calculation:

- i. **Total Benefits:** KES 13 Billion (investment) + KES 2 Billion (accident savings, midpoint) + KES 970 Million (productivity, midpoint) = 16 Billion/year.
- ii. **Total Costs:** KES 7 Billion (compliance) + KES 3 Billion (transition) = 10 Billion/year.
- iii. **BCR:** KES 16 Billion ÷ KES 10 Billion = **1.6**.

5.4. Meso-Level (Consumers and Auxiliary Stakeholders)

Benefits:

1. Job Creation:

- i. **Parameter:** Indirect jobs in logistics, construction, and services.
- ii. **Quantification:** Each KES 130 Million invested creates at least 1- 2 indirect jobs. A KES 13 Billion investment increase could create 100,000 - 200,000 jobs, generating KES 6 – 13 Billion in wages (at KES 65,000/job/month).

2. Community Development:

- i. **Parameter:** Royalties and CSR funds.
- ii. **Quantification:** Royalties (3 - 5% of mineral value) could increase by 20%, yielding KES 650 Million – 1 Billion annually for communities.
- iii. **Source:** Muigua, 2019

3. Environmental Health Savings:

- i. **Parameter:** Reduced healthcare costs from pollution control.
- ii. **Quantification:** A 10% reduction in pollution-related illnesses could save KES 260 Million annually, based on Taita Taveta health impacts.
- iii. **Source:** Lindsay, 2020

Costs:

1. Community Disruption:

- i. **Parameter:** Costs of displacement and local price inflation.
- ii. **Quantification:** Assume KES 650 Million annually for resettlement and KES 390 Million for price increases.

2. Local Infrastructure Strain:

- i. **Parameter:** Costs to local governments for services.

- ii. **Quantification:** Assume KES 260 Million annually Admin. (2023b, October 5).

CBA Calculation:

- i. **Total Benefits:** KES 10 Billion (jobs, midpoint) + KES 970 Million (royalties, midpoint) + KES 260 Million (health) = 11 Billion/year.
- ii. **Total Costs:** KES 650 Million (disruption) + KES 390 Million (inflation) + KES 260 Million (infrastructure) = 1.3 Billion/year.
- iii. **BCR:** KES 11 Billion ÷ KES 1.3 Billion = **8.5**.

5.4.3 Macro-Level (National and International)

Benefits:

1. GDP Contribution:

- i. **Parameter:** Mining sector's contribution to GDP.
- ii. **Quantification:** Mining could reach 5% of GDP (KES 650 Billion) by 2027, up from 0.87% in 2014, with regulations driving growth.
- iii. **Source:** Vision 2030, Bowmans - Kenya Mining Outlook 2023.

2. Export Revenue:

- i. **Parameter:** Increased mineral exports.
- ii. **Quantification:** Exports could rise from KES 21 Billion (2022) to 65 Billion, adding KES 43 Billion annually.
- iii. **Source:** World Bank projections.

3. Environmental Savings:

- i. **Parameter:** Reduced remediation costs.
- ii. **Quantification:** A 10 - 20% reduction in KES 13 Billion annual remediation costs saves KES 1 – 3 Billion.
- iii. **Source:** NEMA

Costs:

1. Enforcement Costs:

- i. **Parameter:** Government expenditure on regulatory bodies.
- ii. **Quantification:** Assume KES 6 Billion annually for inspections and monitoring.
- iii. **Source:** Kenya News Agency, 2023.

2. Fiscal Strain:

- i. **Parameter:** Budget allocation for enforcement.
- ii. **Quantification:** Assume KES 3 Billion annually.
- iii. **Source:** The National Council for Law Reporting

CBA Calculation:

- i. **Total Benefits:** KES 650 Billion (GDP) + KES 43 Billion (exports) + KES 2 Billion (remediation, midpoint) = KES 695 Billion/year.
- ii. **Total Costs:** KES 6 Billion (enforcement) + KES 3 Billion (fiscal) = KES 9 Billion/year.
- iii. **BCR:** KES 695 Billion ÷ KES 9 Billion = **77.2**.

Table 1: Summary of cost benefit ratios

Level	Total benefits	Total costs	Benefit Cost Ratio
-------	----------------	-------------	--------------------

	(KES Billion/year)	(KES Billion/year)	
Micro	16	10	1.6
Meso	11	1.3	8.5
Macro	695	9	77.2

The BCRs indicate that the regulations are economically viable, with significant benefits at the meso and macro levels. The micro-level BCR (1.6) is lower due to high compliance costs, particularly for artisanal miners, which could spark controversy over affordability. The high macro-level BCR (77.2) reflects the potential for national economic growth, driven by increased investment and exports.

5.5 Assessment of Return on Investment (Benefit)

5.5.1 Introduction

The Mining (Mine Health, Safety and Environment) Regulations, 2026 are expected to bring economic benefits that could outweigh initial costs. At the industry level, costs like safety equipment upgrades and environmental compliance may be significant, but benefits such as reduced accidents and increased productivity could lead to a high Return On Investment (ROI), potentially over 500% based on global trends. For local communities, benefits like job creation and royalties are likely to exceed short-term price increases, with an estimated ROI around 580%. Nationally, the ROI could be as high as 3,840%, driven by increased investment and export revenues, though enforcement costs pose challenges. The transformation includes safer workplaces, formalized artisanal mining, and stronger global market positioning, supporting Kenya's Vision 2030 goals.

ROI is calculated as $(\text{Net Benefits} \div \text{Investment Costs}) \times 100$, where net benefits are total benefits minus total costs, annualized for simplicity and discounted at 7% per Kenyan CBA standards.

5.5.2 Micro-Level (Mining Industry Level)

- i. **Costs:** Compliance with new health, safety, and environmental standards will require investments in safety equipment, training, and operational adjustments. For instance, upgrading equipment to meet safety standards could cost around KES 9 Billion annually for large firms, while small-scale miners may face disproportionate burdens, potentially limiting their participation.
- ii. **Benefits:** Reduced accident rates could save costs, with global data suggesting a 20% reduction in incidents (e.g., U.S. MSHA standards). Increased productivity from healthier workers and technological adoption could add KES 60 Billion annually in benefits, including KES 40 Billion from higher output and KES 16 Billion from tech savings.
- iii. **ROI Calculation:** Net benefits (KES 60 Billion – KES 9 Billion = KES 51 Billion), $\text{ROI} = (\text{KES 51 Billion} \div \text{KES 9 Billion}) \times 100 = \mathbf{566.7\%}$. This high ROI reflects potential for firms to scale operations, especially post-moratorium, with benefits like reduced downtime and increased investment.

5.5.3 Meso-Level (Consumers and Auxiliary Stakeholders)

- i. **Costs:** Short-term price increases for minerals due to compliance costs may affect consumers, estimated at KES 1.9 Billion annually for community displacement and local price inflation.

- ii. **Benefits:** Community royalties (KES 4 Billion), indirect job creation (10,000 – 15,000 jobs, KES 7 Billion in wages), consumer savings from lower mineral prices (KES 2 Billion), and health savings (KES 230 Million) total KES 13.23 Billion annually. These benefits stem from regulations promoting local content and stakeholder engagement.
- iii. **ROI Calculation:** Net benefits (KES 13.2 Billion – KES 1.9 Billion = KES 11.3 Billion), $ROI = (KES\ 11.3\ Billion \div KES\ 1.9\ Billion) \times 100 = 596.3\%$. This indicates strong returns for local economies, driven by job creation and community development.

5.5.4 Macro-Level (National and International Level)

- i. **Costs:** Government enforcement and monitoring could cost KES 19 Billion annually, including training inspectors and developing systems, straining fiscal resources given Kenya's projected 5.0% GDP deficit in 2025.
- ii. **Benefits:** GDP contribution could reach KES 650 Billion (5% of projected KES 13 Trillion GDP), forex earnings from exports (KES 43 Billion), infrastructure impact (KES 10 Billion), and critical minerals revenue (KES 65 Billion), totaling 768 Billion annually. These align with Vision 2030's 10% GDP target for mining.
- iii. **ROI Calculation:** Net benefits (KES 768 Billion – KES 19 Billion = KES 749 Billion), $ROI = (KES\ 749\ Billion \div KES\ 19\ Billion) \times 100 = 3,942\%$. This reflects significant national economic gains, driven by investment and global market integration.

Table 2: Summary of the net benefit, investment cost and ROI

Level	Net benefit (KES Billion)	Investment costs (KES Billion)	ROI (%)
Micro	51	9	566.7
Meso	11.3	1.9	596.3
Macro	749	19	3,942

The proposed regulations are likely to yield a positive ROI, with transformative changes enhancing safety, sustainability, and economic contributions across all levels. While exact figures depend on implementation, global precedents suggest long-term benefits will outweigh costs, positioning Kenya's mining sector for growth and global competitiveness.

6.0 Reasons Why Other Regulatory Options Are Not Appropriate

This section highlights reasons why other regulatory options identified above may not be appropriate for the mining sector.

6.1 Option 1: Maintaining the *Status Quo*

Maintaining the status quo will mean that Kenya does not fully operationalize the Mining (Mine Health, Safety and Environment) Regulations, 2026, leaving the mining sector in a state of regulatory limbo that undermines the protection of workers, communities, and the environment. Without full implementation of these regulations, mining operations will continue under outdated frameworks that fail to address the modern challenges and complexities of Kenya's rapidly growing mining industry. This includes persistent risks to miners' safety and health, unregulated environmental degradation, and social conflicts driven by unchecked exploitation of natural resources. Furthermore, the Country will lose the chance to establish itself as a responsible and

competitive mining destination that aligns with global best practices, risking its ability to attract ethical investors and achieve the sector's full economic potential.

Maintaining the status quo will have an impact on the Mining sector as follows:

- i. Implementation of the Mining (Mine Health, Safety and Environment) Regulations, 2026 will remain unachieved, and thus its objectives will remain unattainable
- ii. Increased unsafe and unhealthy working conditions in mines, risking the lives and wellbeing of miners. Mining companies might continue to prioritize profits over safety, leading to increased accidents and occupational diseases without updated and enforceable regulations
- iii. Mining activities could continue to pollute and harm the environment, jeopardizing both biodiversity and the livelihoods of communities dependent on natural resources
- iv. The mining sector could face reputational damage on both local and international fronts. Kenya's image as a responsible mining jurisdiction would be tarnished, discouraging responsible investors and potentially harming trade relationships
- v. Minimal accountability for mining operators without clear safety and health regulations. Enforcement agencies would lack the legal tools to ensure compliance, leading to regulatory gaps
- vi. Lack of adoption of modern, sustainable mining practices. Companies might continue using outdated methods that are more harmful to the environment and workers, delaying the sector's transition to more responsible and efficient practices
- vii. Communities living near mining operations would continue to suffer from social and health impacts. Dust, noise, and chemical pollution would go unaddressed, heightening community grievances and social tensions
- viii. Kenya's mining sector would miss out on opportunities to align with international best practices and standards. This misalignment would make it harder for Kenyan mining products to access global markets, where Environmental, Social, and Governance (ESG) standards are increasingly important
- ix. Undermine Kenya's broader development goals, including efforts to promote sustainable industrialization and environmental stewardship under Kenya Vision 2030 and the Sustainable Development Goals (SDGs). The mining sector's potential to contribute to inclusive and green growth would remain unfulfilled, leaving behind a legacy of inequality and environmental harm.

6.2 Option 2: Other Practical Options

Other practical options can complement or, in some cases, serve as alternatives to achieve similar objectives as the Mining (Mine Health, Safety and Environment) Regulations, 2026. However, they are not always appropriate or sufficient to fully achieve the objectives of the Mining (Mine Health, Safety and Environment) Regulations, 2026. These regulations aim to establish comprehensive, enforceable frameworks to address persistent and systemic challenges in mine health, safety, and environmental management, challenges that often require clear legal mandates rather than voluntary compliance. The limitations for each of the practical options is discussed below.

- i. **No new intervention/do nothing**

This may involve utilizing existing regulations, simplifying or clarifying them, improving their enforcement, or making legal remedies more accessible and affordable. However, this approach may not bring about significant change. The Mining Act, 2016 recognized the need to integrate health, safety, and environmental considerations: Section 176 of the Act stipulates that mining license holders must comply with all environmental protection laws, and it prohibits granting of a mining license without an approved Environmental Impact Assessment (EIA) license and Environmental Management Plan. Similarly, the Act mandates that mine operators adhere to occupational health and safety requirements as per existing labor safety legislation. Despite these clauses, the Act itself did not spell out detailed HSE regulations, instead empowering the Cabinet Secretary for Mining to promulgate specific rules. Over the last decade, several regulations were issued under the Act e.g. on licensing, royalties, local content, and dealings in minerals but dedicated Mine Health, Safety, and Environment regulations were not passed, leaving a regulatory gap. Therefore, in the absence of any new interventions, the industry is likely to remain stagnant, which would be detrimental to all stakeholders in the sector and the country.

ii. Adoption of Industry-Led Voluntary Standards and Certifications

Adoption of Industry-Led Voluntary Standards and Certifications such as the International Council on Mining and Metals (ICMM) Sustainable Development Framework or ISO 14001 can encourage best practices rely on the willingness of companies to participate and self-report. In Kenya, where enforcement capacity has historically been limited and where some mining firms prioritize short-term profits over long-term environmental and safety concerns (Smith et al., 2025), purely voluntary schemes risk inconsistent application and lack of accountability (Ndeda et al., 2024). Voluntary CSR and certification frameworks are often driven by external pressures or public relations concerns rather than genuine compliance with safety and environmental standards (Bice, 2014). Consequently, without mandatory enforcement mechanisms, these frameworks may be insufficient to address deep-rooted hazards in Kenya's mining sector.

iii. Community Engagement and Stakeholder Collaboration

Community engagement and stakeholder collaboration though critical for fostering trust and reducing conflict (Luning & Rajak, 2011) can also fall short when companies engage selectively or superficially. Mining communities near projects in Taita Taveta and Kwale have previously voiced concerns about inadequate consultation (KIPPRA, 2021). This suggests that while community engagement is vital, it cannot substitute for legally binding obligations that ensure worker and community safety.

iv. Adoption of Best Available Technologies (BATs) and Practices

Implementation of Best Available Technologies (BATs) and Practices depends heavily on the financial resources and technical expertise of mining companies (Ccorimanya & Huaraca, 2023). Smaller mining firms, particularly in the ASM sector, may lack the means or incentives to adopt advanced environmental monitoring or safety systems without regulatory requirements and financial support (Munyua et al., 2022). Without mandatory obligations, BATs risk remaining aspirational rather than operational.

v. Capacity Building and Training Programs

Capacity building and training programs for workers and managers can indeed improve safety outcomes (Ndeda et al., 2024). However, such programs require systematic implementation, funding, and follow-up to be effective. In practice, they can be inconsistently delivered, especially if not backed by enforceable standards that ensure workplace compliance and accountability (ILO, 2019). Kenya's mining sector has historically faced challenges in institutionalizing a safety culture, suggesting that voluntary training alone would not meet the comprehensive requirements of the 2026 draft regulations.

vi. Corporate Social Responsibility (CSR) Initiatives

Corporate Social Responsibility (CSR) Initiatives such as health programs and reforestation projects can mitigate specific environmental and health impacts (Smith et al., 2025), these efforts are often ad hoc, vary by company, and are typically driven by external image concerns rather than core operational safety and environmental management (Jenkins, 2004). Without regulatory mandates, CSR lacks the consistency and scope needed to address systemic risks across Kenya's diverse mining landscapes.

vii. Research and Knowledge Sharing

Research and knowledge sharing through platforms such as MINEXPO Kenya can foster innovation and exchange of best practices (Expogr, n.d.). However, these forums do not establish binding commitments or provide clear enforcement mechanisms to ensure compliance with health, safety, and environmental standards (Ndeda et al., 2024). Knowledge sharing, while valuable, must be coupled with regulatory enforcement to drive sector-wide change.

6.3 Alternatives Models of Regulation

Alternative regulation models can achieve similar objectives as the draft Mining (Mine Health, Safety and Environment) Regulations, 2026 by leveraging innovative governance frameworks, stakeholder engagement, and technology-driven approaches. Although they offer innovative pathways to achieve similar objectives, they may not be entirely appropriate due to structural, economic, and socio-cultural challenges. The limitations for each of the models is discussed below.

i. Co-regulation

This model relies on collaboration between government, industry, and communities to develop and enforce standards. While this approach fosters stakeholder engagement, it may be impractical due to weak institutional frameworks and limited community capacity in the Country.

ii. Performance-Based Regulation (PBR)

This model allows flexibility in how companies meet safety and environmental standards, encouraging innovation. However, this model requires robust monitoring and enforcement capacity, which the Country's mining sector lack. A study on occupational health in mining notes that PBR's success depends on strong regulatory oversight to prevent companies from exploiting flexibility to cut costs (Prescott et al., 2022). In Kenya, where regulatory agencies are often underfunded and understaffed, ensuring compliance with performance targets is challenging.

iii. Resilience-Based Regulation

This model focuses on adaptability to environmental and health risks, such as spills or workplace accidents. While promising, this model assumes a level of preparedness and resource availability that may not exist in the Country. In Kenya's ASM sector, where miners often operate informally with limited access to capital, implementing adaptive management plans is impractical. Moreover, frequent environmental shocks, like flooding in mining areas, could overwhelm small operators, making it difficult to achieve the draft regulations' environmental and safety objectives (Prescott et al., 2022).

iv. Incentive-Based Regulation

This model uses economic tools such as tax breaks to encourage compliance. However, this model may not be suitable due to fiscal constraints and inequitable distribution of benefits. A review of mining's social impacts suggests that incentives often favor large corporations, leaving artisanal miners with little support (ScienceDirect, n.d.). Kenya's budget limitations could restrict the government's ability to offer meaningful incentives, and mismanagement risks diverting benefits to well-connected firms. Additionally, incentives may not address immediate health and safety risks, such as mercury exposure in ASM, which require stricter enforcement rather than voluntary compliance (Prescott et al., 2022).

v. Technology-Driven Regulation

This model leverages tools including IoT and Big Data Analytics for real-time monitoring. While innovative, this model is resource-intensive and may be inappropriate for the mining sector, where technological infrastructure is limited. A systematic review of supply chain technologies notes that IoT implementation requires reliable internet and skilled personnel, both of which are scarce in remote mining regions in the Country (ScienceDirect, n.d.). Artisanal miners, who form a significant portion of Kenya's mining workforce, lack access to advanced technologies, making compliance with tech-driven standards unfeasible. This gap could exacerbate inequalities, undermining the draft regulations' goal of inclusive safety and environmental protection (Prescott et al., 2022).

7.0 Conclusion and Recommendation

The RIA for the Mining (Mine Health, Safety, and Environment) Regulations, 2026, demonstrates a comprehensive evaluation of the proposed regulatory framework aimed at enhancing health, safety, and environmental standards in the mining sector. The regulations address critical gaps in the existing framework by introducing stricter safety protocols, enhanced environmental safeguards, and improved compliance mechanisms. These measures are designed to reduce occupational hazards, minimize environmental degradation, and promote sustainable mining practices. The regulations align with international best practices, including the International Labour Organization's (ILO) Convention 176 on Safety and Health in Mines, ensuring global competitiveness and compliance.

The regulations aim to foster a proactive safety culture while minimizing disruptions to operations by integrating advanced technologies, such as real-time monitoring systems and automated safety checks. Overall, the regulations are well-positioned to achieve their objectives of safeguarding human lives, protecting the environment, and promoting sustainable development in the mining sector. The RIA recommends a public consultative process across the country to collect public

views and consider comments on the proposed regulations before gazettetting and implementing them in the country's mining industry.

To ensure the effective implementation of the Mining (Mine Health, Safety, and Environment) Regulations, 2026, the following recommendations are proposed:

1. **Phased Implementation for Small and Medium-Sized Enterprises (SMEs):** To mitigate financial burdens, introduce a staggered compliance timeline for SMEs. This could include a two-year grace period for full compliance, coupled with government subsidies or low-interest loans to support the adoption of required technologies and processes.
2. **Capacity Building and Training:** Develop comprehensive training programs for mine operators, workers, and regulators to ensure awareness and understanding of the new regulations. Collaborate with industry associations and technical institutions to deliver tailored training on safety protocols, environmental management, and compliance procedures.
3. **Technology Adoption Incentives:** Establish incentive programs, such as tax breaks or grants, to encourage mining companies to adopt advanced safety and environmental monitoring technologies. This will facilitate compliance with real-time reporting requirements and enhance operational efficiency.
4. **Strengthened Monitoring and Enforcement:** Create a dedicated task force within the regulatory authority to monitor compliance and conduct regular inspections. Utilize data analytics and digital reporting tools to streamline enforcement and ensure timely identification of non-compliance.
5. **Stakeholder Engagement and Feedback Mechanisms:** Establish a permanent stakeholder consultation platform to gather ongoing feedback on the regulations' impact. This platform should include representatives from industry, labor unions, environmental groups, and local communities to ensure inclusivity and address emerging challenges.
6. **Environmental Restoration Fund:** Mandate contributions to a centralized fund for environmental restoration to address legacy issues from past mining activities. This fund can support reclamation projects and mitigate long-term environmental impacts, particularly in ecologically sensitive areas.