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Occupational Health and Safety Challenges in Developing Countries: Gaps, Opportunities and Policy Implications

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Abstract: *Occupational Health and Safety (OHS) in 2025 has a bleak vision of the world: where the Global North lives in the world of high-tech mental health and AI-inspired analytics, the Global South is concerned with survival on the basic physical levels and the threat of chemicals. The structural imbalances that lead to this divide, which have been discussed in this paper, include the Exportation of hazardous manufacturing to less-regulated markets and the increasing risk of extreme heat due to climate change, which in particular applies to the outdoor workers in tropical regions who constitute 80 percent of the workforce. It is this invisibility that creates a vacuum of data that hides the urgency of reform. However, the article finds significant leapfrog opportunities for traditional, costly safety bureaucracies in adopting digital-first ecosystems. The inclusion of OHS in the Universal Healthcare, mobile-based reporting, and IoT sensors to monitor in real-time, and the introduction of incentive-based compliance among the Small and Medium Enterprises (SMEs) are the most prominent recommendations. The paper concludes that technological innovation and community-based safety models, which would result in sustainable economic growth and protection of human dignity in the Global South, are the only solution to this dis-connectivity.*

Keywords: *Informal sector, OHS, poverty trap, hazards, vulnerability*

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1.0 Introduction

Occupational Health and Safety (OHS) is a multidisciplinary field concerned with the prevention of workplace hazards and the promotion of workers' physical and mental well-being; however, in 2025, it is characterized by a widening global divide. (Carr & Stein, 2025). In high-income countries, OHS discourse has evolved to include advanced mental health models, ergonomic optimization of remote work, and AI-driven predictive safety analytics. (Parsakia & Tabar, 2024). In contrast, the Global South continues to grapple with fundamental occupational risks, where preventing fatal injuries and acute chemical exposures remains the primary concern. This difference underlines a structural imbalance in which the right to a safe and healthy working environment, which has become a core value of the International Labour Organization, ...remains unevenly realized rather than universally guaranteed. (Dellve *et al*., 2025).

This divide has been further exacerbated in the mid-2020s by shifts in global industrialization patterns (Shakleina, 2025). Numerous risky manufacturing activities, especially those that use heavy metals that emit a lot of emissions and volatile chemical manufacturing, have been transferred to the less-controlled markets in the developing world (Schwaegerl, 2025). As much as this shift offers the needed economic impetus and jobs, it tends to happen

in the areas where the safety frameworks are not well prepared to handle the specialized risks that are posed by sophisticated industrial waste and high-speed production lines, effectively transferring occupational health risks to more vulnerable populations (Haslam McKenzie and Eyles, 2024).

At the same time, Jank *et al*. (2025) mentions that the 2025 climate statistics highlights a harsh reality of outdoor work in tropical and sub-tropical areas. To the millions of people working in agriculture, construction, and open-pit mining in Africa, Southeast Asia, and Latin America, extreme heat has evolved from a seasonal inconvenience into a critical occupational hazard. The increasing number of wet-bulb temperature days, when the human body is no longer able to cool down due to the use of perspiration, threatens the viability of traditional outdoor work practices in the region during large parts of the day, causing the epidemic of the chronic kidney disease and heat-related deaths that the existing OHS policies in the areas cannot accommodate (Okokon *et al*., 2025).

According to Chen (2023), a fundamental dimension of this challenge is the structural invisibility of a large proportion of the workforce; in most developing economies, more than 80 percent of the labor force is employed in the informal sector. These employees are street sellers, garbage collectors, and domestic tailors who live completely beyond the sphere of labor regulators and social safety nets (Chen, 2022). Their injuries and illnesses are not registered, so a data vacuum is formed that distorts policymakers into thinking the national occupational health crisis is not as big as it actually is since their activities are not registered. Kenny (2020) confirmed that in the absence of correct data, the urgency behind the necessary legislative change is often blurred in favor of more noticeable economic concerns.

The implementation gap is still a formidable obstacle even in the presence of a strong OHS legislation on paper. The number of labor inspectors to workers in most developing nations is critically inadequate, pathetically, and in most cases, a single officer is in charge of thousands of scattered businesses (Boudreau *et al*., 2023). This lax enforcement climate is worsened by the absence of technical skills and diagnostic resources, so that chronic occupational illnesses, e.g. silicosis or cancer caused by pesticides, are often mistakenly treated as common community diseases. As a result, workers are disproportionately burdened with proving the occupational origin of their illnesses (Dobson *et al*., 2020).

Despite these documented challenges, there remains a significant gap in the literature regarding the integration of structural inequalities, informal labor dynamics, and emerging climate-related risks into a unified OHS framework for developing countries. Moreover, limited attention has been given to how low-cost digital technologies and community-based approaches can address these systemic deficiencies in resource-constrained settings.

This study aims to examine the key occupational health and safety challenges in developing countries, identify critical gaps between policy frameworks and practical implementation, and explore innovative opportunities for improving OHS outcomes through technology and policy reform. The significance of this study lies in its contribution to ongoing policy and academic discourse by offering actionable insights for strengthening OHS systems in developing economies. It highlights pathways for aligning occupational safety with sustainable development goals while safeguarding worker health and dignity.

Finally, this paper argues that the existing OHS trend in the developing world is unsustainable and requires a fundamental rethinking of policy approaches (Lindholm *et al*., 2024). It is

through the identification of the gaps between high-level international norms and local realities of operations that we can find unique opportunities of leapfrogging, the use of low-cost mobile technology and community-based monitoring in order to bypass the high-cost, slow-paced safety evolutions of the past. Haase (2023) clarified that the need to tackle these issues is not just a question of regulatory compliance, but rather a part and parcel of sustainable development, to make sure that economic growth in the Global South does not occur at the unacceptable price of human life and dignity.

2.0 Conceptual Framework: The OHS Gap Analysis

This conceptual framework examines the systemic disconnect between "policy as written" and "work as performed" in developing economies. Top-down drivers are largely shaped by international pressures and the aspiration of developing countries to align with Global North standards
(Mulder, 2023). This includes the adoption of International Labour Organization (ILO) conventions and the formulation of overall national health and safety acts. Although these legislative intentions are up to date and theoretically sound, they often remain poorly implemented due to weak alignment with local institutional capacity and infrastructure required to translate legal provisions into practice localized (Scott & O'shea, 2021).

In contrast, bottom-up realities are shaped by a "survival-first" hierarchy of needs. In contexts characterized by high unemployment and weak social safety nets, workers and small-scale employers often perceive safety measures as costly barriers to economic survival
(Miushe, 2025). Cultural barriers also play a significant role; in the majority of traditional labour conditions, occupational hazards are often normalized as an unavoidable part of work rather than recognized as preventable risks. This creates an attitudinal gap in which personal protective equipment (PPE), even when available, is underutilized due to perceptions that it reduces productivity or increases discomfort, particularly in hot climates because it is perceived to slow down speed or even be uncomfortable in hot weather (Lee, 2025).

Limited technical expertise and unequal resource distribution further exacerbate the OHS gap.

Keefe (2020) confirmed that in the case when a government has a plan to carry out its top-down policies, the lack of trained industrial hygienists, occupational physicians, and modern diagnostic equipment significantly constrains effective monitoring and enforcement. This leads to a policy decoupling effect, whereby large multinational corporations (MNCs) maintain high internal safety standards to protect their global reputation, while domestic small and medium enterprises (SMEs) and informal workplaces operate with minimal regulatory oversight (Tambunan, 2019).

To bridge this gap, mere replication of international legislation is insufficient. An effective contemporary framework must incorporate intermediary drivers, such as mobile-based reporting and community-led safety cooperatives, which translate top-down policy requirements into locally relevant and actionable incentives. It is possible to redesign the policy to be context-sensitive, i.e. to accept that economic survival and worker safety are not mutually exclusive, thereby bridging the gap between national policy objectives and workplace realities through context-sensitive approaches, low-cost technologies, and active community participation (Jaga *et al*., 2024).

In summary, the OHS Gap Analysis Framework highlights three interacting dimensions: top-down policy drivers, bottom-

up socio-economic realities, and intermediary mechanisms that mediate between them. Understanding the dynamic interplay among these elements is essential for designing context-appropriate and effective occupational health and safety interventions in developing countries.

Table 1: Comparative Table showing OHS Legislation vs. Enforcement Reality Comparison of Occupational Health and Safety (OHS) Across Regions

Region / Country	Legislative Framework (Top-Down)	Practical Enforcement Challenges (Bottom-Up)	The "Gap" Outcome
Nigeria (West Africa)	Factory Act / Employee Compensation Act: Mandates workplace safety inspections and employer-funded injury compensation.	Informal Dominance: Over 80% of labor is informal (e.g., Alaba Market, Lagos). Inspectors lack vehicles and fuel to reach decentralized SMEs.	High "Data Invisibility"; most injuries are treated in private clinics without official reporting.
Ghana (West Africa)	National OHS Policy (Draft/Framework): Aims to consolidate fragmented sector-specific laws into a single multi-sectoral authority.	Resource Constraints: Severe shortage of certified Occupational Health physicians; focus remains heavily on infectious disease (Malaria/Typhoid) over industrial toxins.	"Policy Decoupling"; high standards in the mining/oil sector, but near-zero oversight in small-scale "Galamsey" (artisanal) mining.
Vietnam (SE Asia)	Law on Occupational Safety and Hygiene: Requires annual safety training and strict chemical labeling for all manufacturing units.	Rapid Industrialization: Growth outpaces inspector training. Supply chains involve thousands of "home workshops" that bypass official audits.	"The Shadow Factory" effect; Tier 1 suppliers are compliant, but Tier 3 sub-contractors operate with high chemical/fire risks.
Thailand (SE Asia)	Occupational Safety, Health and Environment Act: Advanced regulations including mandatory "Safety Officers" for firms with 2+ employees.	Migrant Labor Vulnerability: Large numbers of undocumented workers from neighboring states fear reporting injuries due to deportation risks.	Language barriers and "Legal Fear" prevent the actual utilization of the robust existing legal protections.
Global Standard (ILO)	Convention No. 155 & 187: Sets the "Gold Standard" for national OHS systems and preventative safety cultures.	Economic Survival: In low-GDP regions, PPE is seen as a "sunk cost." Safety is often traded for "danger pay" (slightly higher wages for high-risk tasks).	A "Paper Compliance" culture where manuals exist to satisfy foreign investors but aren't followed on the shop floor.

3.0 The "Double Burden" of Hazards

In developing economies, the workforce faces a "double burden" where traditional industrial hazards coexist with emerging environmental risks, creating a complex risk profile that overwhelms existing healthcare and regulatory infrastructures.

Table 2: Profile of Occupational Health Hazards in Developing Economies

Hazard Category	Developing Country Context	Prevalence/Severity
Traditional	Manual scavenging, unsafe scaffolding, dust (silicosis)	Very High
Chemical	Unlabeled pesticides, lead acid battery recycling	High (Unregulated)
Environmental	Extreme heat (45°C+), lack of clean hydration	Rising (Climate)
Biological	Poor sanitation in factory dorms, zoonotic risks	Moderate to High

As illustrated in Table 2, the hazard profile in developing nations is characterized by a high prevalence of "Traditional" risks, such as silicosis and physical trauma from unsafe scaffolding, which have largely been mitigated in the Global North through automation and strict engineering controls. However, this is compounded by a "Chemical" category where unregulated recycling and unlabeled toxins pose severe long-term health risks to workers who lack both protective equipment and the right to know about the substances they handle. Perhaps most critical for 2025 is the "Environmental" category; with extreme heat exceeding 45°C, the physical limit of human labor is being tested, turning climate change into a direct occupational killer. Finally, the "Biological" hazards linked to poor infrastructure and factory housing highlight that in these regions, workplace risks are not confined to the shop floor but extend into the living conditions of the workers, creating a holistic crisis of human dignity and safety (International Labour Organization, 2023).

4.0 The Informal Sector Challenge

Occupational Health and Safety (OHS) is facing a very significant challenge in the informal sector due to the fact that there is a regulatory blind spot (Liza *et al*., 2025). In countries such as Nigeria or Vietnam, where the overwhelming percentage of the labor force ...comprises street traders, artisanal miners, and home-based garment workers, there is no employer-employee agreement to provide safety standards. Limited access to social security, health insurance, and labour union representation has been widely documented by Petach & Wyant (2023) regarding these workers. As a result, responsibility for risk management is effectively shifted entirely onto individuals. This creates a “safety trap,” whereby severe poverty compels workers to accept hazardous working conditions like handling toxic e-waste or working on an unsafe construction site, .as immediate income needs outweigh perceived long-term health risks of chronic illness or harm (Robinson *et al*., 2021). Moreover, the informal sector is structurally invisible, which causes a dangerous Data Vacuum that obstructs national policy. Fuller (2019) affirmed that since the workplaces are not registered, the incidents of injuries and fatalities are often absent from official statistics and instead manifest as broader community health issues or domestic incidents in the community health problems, or in the domestic accidents. This represents a critical empirical gap that limits the ability of policymakers to justify investment in OHS interventions for informal workers (Sway & Materu, 2024). In

the absence of a system to trace these dangers, the vulnerability cycle repeats itself: one workplace accident can leave a major breadwinner helpless, depriving the family of its source of income and ...forcing children into hazardous labor to compensate for lost income (Tait, 2024).

\Fig/ 1 illustrates the poverty trap and its implications for occupational vulnerability (Vorster, 2024), while Figure 2 presents the broader vicious cycle of poverty (Corporate Finance Institute, 2023). These frameworks reinforce how occupational risks and economic deprivation are mutually reinforcing.

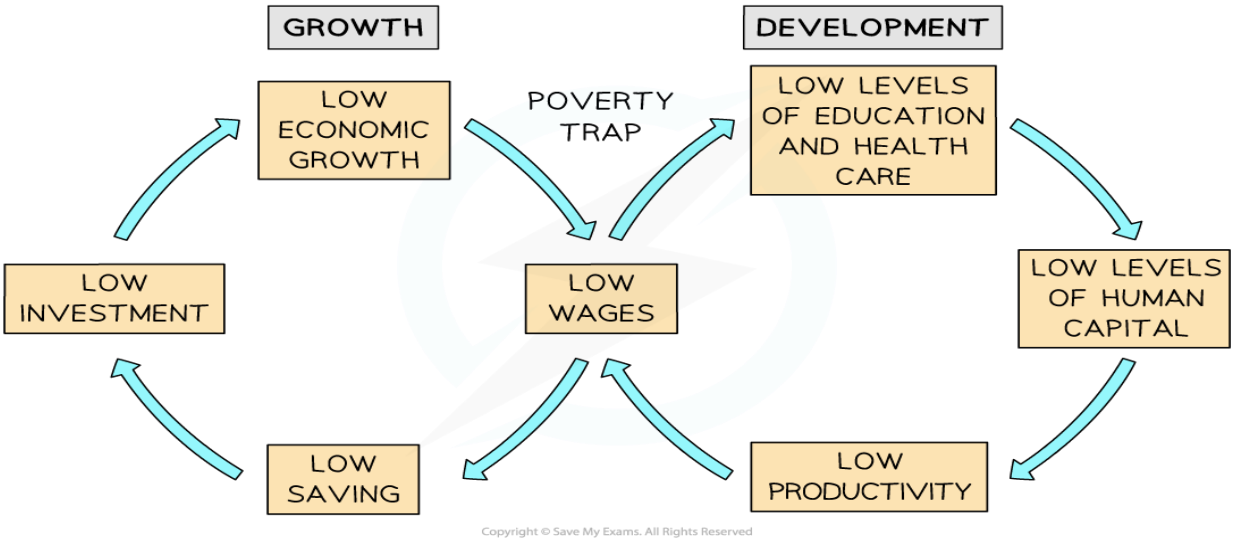

Fig. 1: Poverty traps: Growth and development cycle (Vorster, 2024).

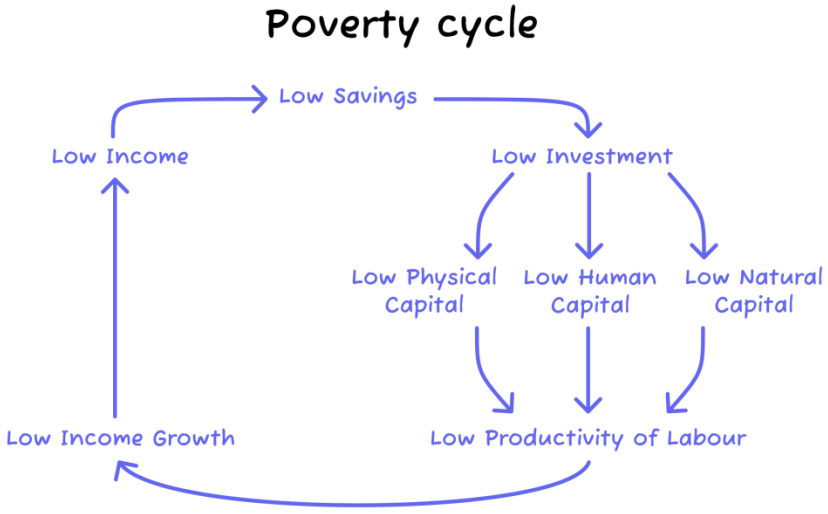

Fig. 2: Vicious cycle of poverty (Corporate Finance Institute, 2023)

5.0 Opportunities: Technological Leapfrogging in OHS

The concept of technological leapfrogging in Occupational Health and Safety (OHS) suggests that developing countries can bypass

traditional, incremental stages of safety system development (Parisien, 2023). These nations will be able to jump directly to digital-first safety ecosystems, rather than the old system of building up ...resource-intensive bureaucratic systems, large inspectorates, and fixed-location monitoring infrastructure (Jiang, 2022). Within this OHS evolution framework, countries can bypass auditing and move directly to real time, decentralized safety management. This change is precipitated by ...driven by the democratization of technology, where high compliance costs are replaced by affordable digital connectivity and automation in 2025 (Artibani, 2025).

Mobile-first reporting systems and low-cost sensors are central to this transformation (Kumara & Wickramasinghe, 2025). Where smartphone access is near universal and labor enforcers are scarce, a mobile application can be employed as a digital platform for reporting hazards and accessing safety information, with the informal workers reporting work-related dangers or receiving safety education in their native languages in the form of audio-visual interfaces. Simultaneously, low-cost, battery-powered IoT sensors can be used in small-scale textile factories or artisan mines, and ...enabling continuous monitoring of air quality, noise levels, and temperature (Misbachudin, 2025). They provide real-time monitoring to employees and distant health officers to identify toxic exposures, e.g. silica dust or chemical fumes, long before they can result in chronic respiratory disease, which means high-tech security at a fraction of the traditional cost (Zimmerman *et al*., 2023).

Furthermore, Emimi *et al*. (2023) outlined how the solution to the inspection of the hazardous or inaccessible infrastructure, such as high-altitude telecommunications towers or deep-pit mines, can be addressed through the use of drones and remote sensing technologies.

In the developing regions, where heavy safety gear or special climbing equipment may be unavailable or in poor condition, drones can be utilized to conduct structural integrity inspections, without risking human life (Mohsan, 2023). This technological innovation replaces the manual checks, which are risky, with high-resolution thermal and visual information. These new tools will enable developing nations to build a culture of strong safety, which is both data-driven and inclusive and bring even the most remote or informal workplace under a protective digital umbrella (Esterhuyzen & Mabotja, 2025).

6.0 Policy Implications and Recommendations

Translating OHS frameworks from theory into effective practice in developing countries requires a shift away from purely punitive regulatory approaches. (Nafid *et al*., 2024). The policy landscape of the 2025 must be based on integration and empowerment, and it must be noted that...OHS must not be treated as a secondary priority but integrated into broader socio-economic systems (Rouhsedaghat *et al*., 2021).

6.1 Combining OHS and Universal Healthcare (UHC)

The most significant policy change is the one that relates to the notion of the Mainstreaming OHS, meaning the introduction of the occupational health surveillance to the Universal Healthcare systems of the developing nations (Hall, 2022). Most community health clinics in the Global South today treat the symptoms of the disease (respiratory distress or dermatitis), however, they fail to investigate the workplace as the source of the illness. The primary healthcare providers can also be trained to record occupational histories and shared digital health records allow governments to identify the industrial disease hotspots (Jimenez, 2020).

This integration reframes OHS from a narrowly defined labor issue into a broader public health priority (Ashari, 2022).

6.2 Incentive-Based Compliance for SMEs

For many SMEs, safety investments are perceived as sunk costs that threaten profit margins (Fabre & Straub, 2023). To fill this, the policies must be changed to Incentive-Based Compliance. Governments can provide targeted incentives, such as tax relief or preferential access to public contracts, such as micro-tax exemption or priority in government contracts to companies that report offering basic PPE and safety training, instead of imposing fines, which are difficult to enforce in the informal sector (Dube & Casale, 2019). By making safety a business asset rather than a legal liability, the state can encourage a race to the top where the only way to achieve economic growth is by complying with the game (Athallah *et al*., 2025).

6.3 Safety Champions and Safety in the Neighborhood

Finally, the most effective way to reach the informal sector is through the so-called Community-Led Safety models that allow the informal groups to have their own Safety Ambassadors i.e. local market cooperatives or artisanal mining associations (Tingini and Eniowo, 2025). These heroes are trusted colleagues that are trained to identify immediate risks and exhibit low-cost reduction strategies (Nurfadilah *et al*., 2025). In the process of decentralization, the government will be in a position to harness the available social capital to create a grassroots safety culture (Rosviana & Supratikta, 2025). Safety interventions can be culturally aware and readily available by having a collaborative leader allocate cooling vests or operate a common first-aid station without the top-down friction that is likely to freeze conservative regulatory efforts.

7. 0 Conclusion

This conceptual paper concludes by noting that the solution to Occupational Health and Safety (OHS) is not just a regulatory burden, but a Golden Opportunity for sustainable economic change in developing nations. By transforming the perception of OHS into a strategic investment and not a cost center, these countries will be able to substantially enhance their human capital. A healthier and safer workforce is more productive in nature because, it experiences fewer disruptions as a result of chronic illness and work-related injuries. It is not only proactive but also offloads the already strained national healthcare systems with an immeasurable burden as the limited public funds are channeled towards the developmental objective and infrastructure at large rather than curing the avoidable industrial accidents.

Furthermore, a good OHS system is a good sign to the global market, and emerging countries are decent and ethical locations to invest in quality foreign direct investment (FDI). As the world supply chains are increasingly being checked to meet the Environmental, Social and Governance (ESG) requirements, nations that are concerned about the welfare of their employees can stand out among low-road competitors. By leaping frogging technologies and community-based programs, the developing countries can ensure that industrialization process is an inclusive and resilient one bridging the gap between the national policy and the reality at the ground level. Lastly, the safety as an essential component of the national development plans is the assurance that the economic prosperity is not attained at the cost that is intolerable to humankind, but it is a pillar of economic prosperity and honor of all employees in the long term.

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Oluwaseun Ibuife Oluwaniyi conceived, designed, and led the study, conducted the literature review, developed the framework, analyzed findings, and drafted the manuscript. Divine Ikechukwu Duruobioma contributed to research design, literature review, data interpretation, and manuscript revision. Both authors collaborated on analysis, writing, editing, and approved the final version of the manuscript for publication.