Behaviour-Based Safety, Human Error, and Mens Rea: A Socio-Legal and Behavioural Analysis of Liability for Workplace Accidents in Ghana's Construction Industry

Justine Adua Avogo
Department of Management - Signum Magnum College, Malta

Abstract
This paper offers a socio-legal analysis of liability based on Behaviour-Based Safety (BBS) evidence and the legal principle of mens rea in workplace accidents in Ghana's construction sector. Using a doctrinal–qualitative research design, the study combines a doctrinal analysis of Ghanaian statutes and case law with a thematic synthesis of peer-reviewed safety research and official investigation reports (2021–2024). This interdisciplinary approach develops a structured framework for systematically aligning BBS-derived behavioural data with Ghanaian legal standards of foreseeability, negligence, and recklessness. The findings indicate that organisational and cultural factors, of which informal labour relations, weak supervision, and production pressure are the most important, are associated with unsafe acts in Ghanaian construction. Moreover, the study also reveals that persistent unsafe practices, supervisory omission, and the normalisation of deviance have legal significance, allowing courts to infer foreseeability and constructive knowledge for liability attribution. The contribution presents a practical mechanism for integrating BBS evidence into legal proceedings under Ghanaian law. It offers a pathway for more consistent, transparent, and evidence-based mens rea attribution in workplace accident cases.

Keywords:
Behaviour-Based Safety; mens rea; Ghana construction industry; organisational negligence; workplace accidents; legal liability.

1. Introduction

Ghana's construction industry continues to be one of the most dangerous sectors in the country, with common fatalities and serious injuries attributed to falls from height, electrocutions, trench collapses and equipment misuse, evidencing poor occupational health and safety practices and severe exposure to risks in this area (Osei-Asibey et al., 2021; Adzivor et al., 2024; Ankamah-Lomotey, 2025). On daily field observations on construction sites, unsafe activities, including (but not limited to) nonuse of PPE, avoidance of basic control measures for work at height and dependence on improvised access arrangements, are demonstrated to be influenced by production pressure, peer influence, weak supervision and long-standing site patterns (Tannor et al., 2023; Boakye et al., 2022; Adzivor et al., 2024; Osei-Asibey et al., 2021).

Lack of any formal process for connecting behavioural evidence to legal terms of fault underpins a significant shortcoming in Ghana's accident investigative and enforcement policy and is often characterised as weak, fragmented, and overly dependent on crude procedures, rather than systematic behavioural analysis (Boadu, Wang & Sunindijo, 2021; Ankamah-Lomotey, 2025). Instead, findings are typically couched in broad descriptive terms, including "failure to provide PPE," "poor supervision," or "unsafe system of work", without systematic behavioural patterns that might help identify what workers, supervisors, and employers knew or should have known at the material time (Boadu, Wang & Sunindijo, 2021).

Using BBS Evidence: This article argues that Behaviour-Based Safety (BBS) evidence

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provides a stronger, more systematic basis for mensreaidentificationin Ghanaian construction accidents than traditional investigation methodologies.

Consequently, the article analyses the feasibility of systematically incorporating Behaviour-Based Safety evidence into the legal determination of culpability in construction accidents in Ghana, and the implications of matching BBS mechanisms with the law of mens rea.

2. Literature Review

2.1 Literature Positioning

This study draws on two broad strands of scholarship, albeit those streams are insufficiently incorporated. First, Behaviour-Based Safety (BBS) research offers research tools and instruments that empirically assist in the identification and quantification of not only unsafe behaviors and their antecedents, but also the role of organisational safety climate and culture in assessing risk and behaviours, especially in high-hazard work, such as construction work, where unsafe acts contribute significantly to accidents (Cara et al., 2024; Rusyda & Abdul Aziz, 2021). Behaviour-Based Safety (BBS) methods utilise observable behaviours, feedback and behaviour modifications to mitigate unsafe behaviours and increase compliance with safety processes, moving the orientation of the attention away from controls on hazards towards control of behaviours, and interaction with safety systems, on both the part of the worker and systems (Cara et al., 2024). Second, legal and regulatory studies of workplace accidents concentrate most on work-related statutory obligations and the enforcement of these duties, and on fault-based liability regimes in tort and criminal law, particularly foreseeability, and duty of care claims under negligence (Almond, 2020; Caparo Industries PLC v Dickman [1990] UKHL 2).

2.2 Ghanaian Behavioural and Cultural Safety Evidence

An emerging body of literature in the Ghanaian construction industry demonstrates that contextual and cultural factors, such as prevailing organisational practices, informal labour relations, and socio-cultural norms, shape risk perceptions and safety behaviours related to workplace safety outcomes. Research evidence also shows that Ghana's construction industry remains plagued by a poor safety culture, low worker involvement, and institutional barriers to effective management and accident prevention (Adzivor et al., 2024; Adzivor, Emuze & Das, 2023).

More specifically, research has shown that safety culture maturity in Ghana's construction firms is generally low (Adzivor, Emuze & Das, 2023), including poor communication, limited safety training, and an emphasis on productivity rather than risk control, which are conducive to unsafe practices on the job site.

2.3 Legal Theory and Mens Rea Scholarship

The modern criminal law tradition, as reflected in its current literature, emphasises that mens rea (the mental element of criminal liability, also known as the doctrine of mens rea) is another underlying principle of criminal jurisprudence. This legal theory mandates proof of a guilty mind alongside a culpable act (Foster, 2025). Landmark cases in the legal literature underline the assertion that mens rea standards of law that are fundamental in the criminal law and in the case of organisational law that the court of law are not merely theoretical constructs but also operate in practice as an interface to be put into play on how the courts adjudicate fault in statutory and regulatory liability, particularly when organisational behaviour is concerned; (as with corporate actors) a criminal act of negligent or recklessly negligent acts, such as criminal negligence, may be held for all cases where the behaviour of corporate executives is inferred from the state of mind of senior executive management based on corporate policy and, with this assumption, from corporate policy and omissions (Horder, 2022; R v G and another[2003] UKHL 50).

Legal scholarship also situates these doctrines under changing safety governance frameworks by examining the degree to which mens rea norms interact with regulatory crimes and corporate criminal liability, where 'traditional' liability standards of mens rea are reconfigured and debated with respect to regulatory offences and corporate culpability when the objectives of public welfare and enforcement policies inform the traditional criteria for fault formation. Within regulatory compliance, scholars have pointed to a continuing conflict between demanding a

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guilty mental stance and enforcing strict liability for safety violations, and the consequences for organisational or agent responsibility (Foster, 2025; Cronin, 2022).

2.4 Identified Gaps and Justification for the Study

This gap necessitates a theoretical framework capable of translating behavioural evidence into legally cognisable indicators of *mens rea*, because Ghanaian criminal liability turns on objective and subjective fault thresholds, particularly negligence and recklessness, defined by what an accused person knew or ought reasonably to have known under section 13 of the Criminal Offences Act, 1960 (Act 29) (Horder, 2022).

2.5 Behaviour-Based Safety: Behaviourist and Socio-Cognitive Theories

2.5.1 Behaviourist Foundations of BBS

Behaviour-Based Safety (BBS) is grounded in contemporary behavioural science principles that emphasise how workplace behaviour is shaped through observable antecedents, reinforcement, and feedback mechanisms (Cara et al., 2024; Li & Long, 2019).

2.5.2 Socio-Cognitive Perspectives and Observational Learning

Recent empirical evidence from Ghana shows that deviance is normalised through observation, with repeated exposure to unsafe practices internalised, leading to a lowering of perceived risk and thus the reinforcement of unsafe norms of behaviour (Tannor et al., 2023; Adzivor et al., 2024; Boakye et al., 2022). Observational learning is hence crucial for understanding how workers' cognitive awareness of risk is formed, since norms are learned through modelling and pressure to conform from workgroups, and not solely through instruction (Li et al., 2021; Yang et al., 2024; Li et al., 2024). Legally, this means exposure to such unsafe models can be used to support the view that the hazards were observable, knowable and foreseeable, which would increase the argument that supervisors or employers had a duty to act under the Labour Act, 2003 (Act 651), with sections 118–120 (Labour Act, 2003 (Act 651)).

2.5.3 Empirical Evidence of Entrenched Unsafe Behaviour in Ghanaian Construction

- In *Asantekramo alia Kumah v. Attorney-General* [1975] 1 GLR 319 as reported in Plange-Rhule (2022), the Supreme Court affirmed that omissions and failure to act may ground legal responsibility where a duty to intervene exists. This reasoning aligns with the employer's statutory obligation under the Labour Act, 2003 (Act 651), to ensure safe and healthy working conditions, particularly under sections 118–120.
- Under Ghanaian law, such omissions constitute breaches of statutory duties to provide information, training, and supervision, thereby supporting findings of organisational negligence or constructive knowledge under the Labour Act, 2003 (Act 651), particularly sections 118–120. This position is consistent with the Supreme Court's reasoning in *Ayisi v Ghana Ports and Harbours Authority* [2004] SCGLR 106, where the Court held that an employer's failure to put adequate safety systems and supervision in place was sufficient to ground liability for workplace injury.

2.5.4 Legal Implications: How Behavioural PatternsInfluenceMens Rea Determinations

In construction accident law, the patterns mentioned above carry profound implications for establishing mens rea. In a case in which unsafe conduct is routine, habitual behaviour or is culture-based rather than consciously seeking risk, fewer courts can infer intention or subjective recklessness because the actor may not have the level of awareness or advertence to risk necessary to be considered criminally culpable (Horder, 2022). In these contexts, liability analysis usually deviates from the concepts of intention or recklessness towards negligence or organisational fault based on failure to act, system failure, and failure to adhere to rules and regulations (Horder, 2022; Parker & Nielsen, 2022).

The development of the focus from individual will through ethical conduct to a focus on an organisational omission mirrors regulatory theory that places any harm resulting from such normalised unsafe routines as an oversight of compliance processes rather than an intentional omission (Parker & Nielsen, 2022).

Employers and supervisors were also supposed to have been aware of behavioural drift. Consequently, they ought to have intervened with training, enforcement or corrective

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supervision of work that is a part of their statutory duty to provide a safe system of work under the Labour Act, 2003 (Act 651), in particular sections 118–120. Under Ghanaian law, an employer cannot escape liability; it is not feasible for any employer to cite the failure to provide warnings where unsafe practices are inevitable, visible and repeated in the workplace and thus avoidable, in other words, negligence based on omission as well as lack of a safe system of work as it is asserted by the Supreme Court in Ayisi v Ghana Ports and Harbours Authority [2004] SCGLR 106.

2.5.5 Synthesis: Behavioural Theory as a Bridge to Legal Doctrine

As such, the predictability of unsafe behavioural patterns found via Behaviour-Based Safety analyses is key legally as it fulfills the requirement that an employer or supervisor is reasonably expected to know of the risk, establishing foreseeability and constructive knowledge for omission-based liability under s13 of the Criminal Offences Act 1960 (Act 29), coupled with sections 118–120 of the Labour Act 2003 (Act 651).

2.6 Mens Rea: Legal Theory and Doctrinal Context

Contemporary scholarship in criminal law distinguishes between intention, recklessness, and negligence as analytically separate fault thresholds, each indicating particular degrees of moral blameworthiness and of risk awareness necessary for criminal liability (Horder, 2022). Intention entails a deliberate purpose to bring about a prohibited consequence; recklessness denotes conscious awareness of a risk coupled with unjustified disregard of that risk; and negligence arises where harm results from a failure to meet the objective standard of care expected in the circumstances, even in the absence of subjective awareness (Horder, 2022; Parker & Nielsen, 2022).

Under Ghanaian law, these differences in theory are captured in the statute and interpreted by the courts. The Ghanaian legal system takes a context-specific approach to fault evaluation, considering on-site conditions, organisational systems, and supervision when assessing a negligence or omission issue rather than individual intent. This is the reasoning behind the Supreme Court's decision in Ayisi v Ghana Ports and Harbours Authority [2004] SCGLR 106, where unsafe working conditions and inadequate supervisory practices were held to be central to establishing employer liability for foreseeable harm. It is also supported by statutes that define employers' duties under sections 118–120 of the Labour Act 2003 (Act 651).

Table 1: Summary of Ghanaian Judicial Approaches to Risk, Intent, and Responsibility

Repeated unsafe acts in the workplace	Objective foreseeability is established; liability turns on what the actor or employer ought reasonably to have known, grounding negligence rather than intention	Criminal Offences Act, 1960 (Act 29), s.13 (negligence standard); Ayisi v Ghana Ports and Harbours Authority [2004] SCGLR 106
Supervisory tolerance of shortcuts or rule-breaking	Sustained inaction constitutes constructive knowledge and omission, supporting organisational negligence	Labour Act, 2003 (Act 651), ss.118–120; Ayisi v Ghana Ports and Harbours Authority [2004] SCGLR 106
Cultural normalisation of unsafe practices	Weakens inference of individual subjective recklessness but heightens employer liability through failure to correct foreseeable risk	Labour Act, 2003 (Act 651), ss.118–120
Absence of training or safety induction	Negates recklessness at worker level but grounds organisational negligence for breach of statutory duty	Labour Act, 2003 (Act 651), ss.119–120; Ayisi v Ghana Ports and Harbours Authority [2004] SCGLR 106
Visible but uncorrected workplace hazards	Supports inference of organisational omission and constructive knowledge even without proof of subjective awareness	Ayisi v Ghana Ports and Harbours Authority [2004] SCGLR 106; Labour Act, 2003 (Act 651), s.118

Source: Author, 2025

The following section outlines the methodological approach for examining the intersection of behavioural and legal evidence. This ensures analytical transparency and supports the integration of doctrinal and empirical insights throughout the paper.

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3. Research Methodology

3.1 Research Design

3.1.1 Overall Study Design

The present study features a doctrinal–qualitative socio-legal research design that amalgamates safety behaviours with legal analysis and follows modern evidence-based approaches towards regulation and criminal justice (Parker & Nielsen, 2022; Horder, 2022).

3.1.2 Data Sources

(a) Behavioural Evidence Sources

Behavioural evidence was extracted from peer-reviewed safety studies published between 2021 and 2024, which focused on antecedents of behaviour, unsafe practices, organisational culture, supervisory strategies, and safety climate in the construction industry (Agyekum et al., 2022; Sherratt et al., 2022; Adzivor et al., 2024).

(b) Legal Evidence Sources

The legal framework relied on Ghana's fundamental legislation regarding criminal liability and workplace safety, comprised of provisions found within the Criminal Offences Act, 1960 (Act 29), Labour Act, 2003 (Act 651), the Factories, Offices and Shops Act, 1970 (Act 328) and the Minerals and Mining (Health, Safety and Technical) Regulations, 2012 (L.I. 2182). Modern criminal law and regulatory scholarship synthesise principles of responsibility, fault attribution, and mens rea in today's risk-regulated environment — further informing doctrinal analysis (Horder, 2022; Parker & Nielsen, 2022).

Ghanaian case law—Ayisi v Ghana Ports and Harbours Authority [2004] SCGLR 106—was used to draw on judicial reasoning on foreseeability, constructive knowledge, supervisory omission and the employer's duty of care in workplace settings. The Supreme Court in Ayisi ruled that unsafe working conditions and inadequate supervision were sufficient to establish employer liability for foreseeable harm arising from an omission rather than deliberate wrongdoing.

Such sources, together, will ensure that each behavioural claim made in the analysis is identified as involving research conducted in a peer-reviewed empirical study or an identifiable Ghanaian judiciary, thereby enhancing the credibility, disclosure, and auditability of the evidence base underpinning the thesis.

3.1.3 Inclusion and Exclusion Criteria

Sources were included based on four criteria:

1. Direct relevance to construction safety or behavioural risk patterns, particularly unsafe acts, safety climate, and supervisory influence within construction settings (Agyekum et al., 2022).
2. Methodological transparency and empirical grounding are consistent with established standards for rigorous qualitative synthesis and thematic analysis (Braun & Clarke, 2021).
3. Explicit or inferable implications for legal liability, including foreseeability, risk awareness, and omission-based responsibility relevant to *mens rea* and negligence analysis.
4. Publication between 2021 and 2024, ensuring that the evidence reflects current behavioural, organisational, and safety-management trends relevant to the Ghanaian construction sector.

Evidence was excluded where it relied on anecdotal testimony, lacked methodological clarity, or addressed unrelated industries with limited transferability to construction. This ensured a high-quality dataset capable of supporting defensible doctrinal–behavioural integration.

3.1.4 Data Extraction Procedures

To extract statutory definitions and judicial interpretations of intention, recklessness, negligence, and constructive knowledge, legal materials were reviewed in accordance with contemporary doctrinal analysis standards in modern criminal law and regulatory scholarship (Horder, 2022; Parker & Nielsen, 2022). Evidence from behavioural materials was reviewed to identify recurring patterns of behaviour, including repeated violations, uncorrected unsafe acts, supervisory tolerance, peer modelling, and organisational cultural norms based on validated peer-reviewed construction safety studies and work-based behaviour research in organisations.

3.1.5 Coding and Thematic Analysis

A systematic organisation and analysis were performed using NVivo 12, which enabled transparent coding, retrieval, and comparison of qualitative data (QSR International, 2021). The first stage involved opening coding to separate discrete behavioural aspects, such as refusal to wear PPE, taking shortcuts, and peer

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imitation. Axial coding later clustered these indicators into higher-level analytic categories, including habitual unsafe practice, supervisory omission, and cultural reinforcement. Selective coding then grouped these categories into overall, legally relevant themes such as foreseeability, risk awareness, and organisational negligence, underpinned by well-known thematic analysis principles (Braun & Clarke, 2021) and contemporary socio-legal perspectives on regulatory compliance and organisational fault in environments where risk exposure is a salient concern (Parker & Nielsen, 2022). In this iterative analytical process, we created coherent accounts while retaining the contextual richness and explanatory depth of the behavioural data.

3.1.6 Triangulation Strategy

The Ghanaian statutory law and authoritative judicial reasoning on employer duties, omission-based liability, and foreseeability, particularly as articulated by the Supreme Court, were used as an analytical tool for determining whether evidence of established behavioural patterns would give reasonable weight to the findings of negligence or organisational fault in light of judicial reasoning (Ayisi v Ghana Ports and Harbours Authority [2004] SCGLR 106; Labour Act, 2003 (Act 651), ss. 118–120). This enhanced interpretive credibility by allowing behavioural evidence and legal reasoning to support, rather than contradict, one another in the attribution of fault and the determination of legally cognisable risk.

3.1.7 Measures to Maximise Rigour

Rigour was achieved through the recording of a log of analytic decisions, maintaining coding consistency, and reflexive checks aligned with the norms of qualitative research (Braun & Clarke, 2021). Validity would be achieved through triangulating multiple sources of data, reliability through transparent methodological reporting, and confirmability through systematic, auditable coding procedures that align well with contemporary qualitative best practice.

3.2 Qualitative Thematic Review

Published from 2021 to 2024, a narrative synthesis of empirical safety research in Ghanaian construction sites was performed and is aligned to qualitative synthesis processes as a whole that undergird socio-legal and safety research that centres on theme-driven integration, contextualised interpretations, and transparency in the inclusion of evidence (Braun & Clarke, 2021; Parker & Nielsen, 2022). The sources of data included peer-reviewed journal papers, formally documented accident investigations reported in secondary academic sources, and local observational studies pertinent to construction safety practice.

3.3 Conceptual Modelling

A hybrid framework was established that merges BBS (Behaviour-Based Safety) behavioural chains with legal causation models, enabling behavioural evidence to be analysed in a structured manner against legislation on fault and responsibility in regulated workplaces (Parker & Nielsen, 2022; Horder, 2022). Ethical considerations were limited; the study used only publicly available and secondary data sources, as is the norm for ethical qualitative and socio-legal research and for the incorporation of non-reactive data (Braun & Clarke, 2021).

3.4 Limitations and Transparency

This research has some methodological and contextual limitations that should be taken into account when interpreting its findings.

Selection bias is expected, as most construction incidents do not reach the point of prosecution or result in published judicial decisions, leaving less behavioural evidence available in actual case law. While these are not drawbacks to the study's main analytical contribution, they present a clear opportunity for future empirical validation: through the integration of behavioural–legal case studies, access to longitudinal safety datasets, and closer scrutiny of judicial engagement with behavioural evidence in workplace accident litigation (Parker & Nielsen, 2022).

4. Results and Discussion

The behavioural–legal framework developed above is extended to construction accident cases where evidence suggests they occurred in Ghana. When Behaviour-Based Safety (BBS) logs identify a lack of adequate training, uncertain instructions or intermittent oversight, responsibility shifts upwards to organisational negligence, encapsulation of the statutory

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obligations placed on employers and supervisors under Ghanaian labour and occupational safety legislation (Labour Act, 2003 (Act 651); Parker & Nielsen, 2022). In the latter respect, BBS evidence acts as a formal evidence conduit between the actual behaviour that could reasonably be inferred in the workplace and the mental state which is necessary for the holding of a person criminally liable based on (but not limited to) omission and failure to prevent foreseeable harm under the Criminal Offences Act, 1960 (Act 29).

4.1 Worker Conduct and Mens Rea

In such cases, negligence can be found where workers fail to take reasonable care and exercise due care, such as under the objective negligence standard codified in section 13 of the Criminal Offences Act, 1960 (Act 29). Recklessness, on the contrary, depends on proving the existence of conscious awareness of danger along with a lack of justification for the necessary risk of carrying forward in light thereof, which requires a higher level of cognitive judgement than in modern-day criminal law doctrine compared to negligence (Horder, 2022). This awareness can be evidenced by observing behaviour (which is consistent with unsafe behaviour) shown on numerous occasions, indicating that a worker may have repeatedly been dangerous, despite being trained in safety, previously warned, inducted into a situation, or put in place a notice about the risk to the worker.

Failure to utilise personal protective equipment (PPE) despite documented warnings, training or supervisory instructions may therefore elevate liability from negligence to recklessness if evidence establishes actual or deliberate disregard of a known danger.

Therefore, in legal proceedings, Behaviour-Based Safety (BBS) logs can serve as a comparator to typical evidence of notice, as they can document routine exposure to risk-related information and opportunities to correct behaviour. Where BBS data indicate ongoing unsafe conduct despite recorded interventions, it bolsters evidence of recklessness or, at the very least, ‘aggravated negligence’ based on omission and failure to respond to known risk (Criminal Offences Act, 1960 (Act 29)).

4.2 Supervisory Liability

Under section 119 of the Labour Act, 2003 (Act 651), supervisors and persons in control of workplaces are under a statutory duty to ensure that work is carried out without undue risk to the health and safety of workers, including an obligation to prevent foreseeable hazards through adequate supervision, control, and enforcement of safety measures.

- Tolerance of unsafe or improvised scaffolding,
- Failure to enforce fall protection requirements, and
- Repeated inaction in the face of known unsafe acts.

Ghanaian Courts have recognised that omission of supervisory requirements can support employer and organisation liability in the presence of unsafe systems of work without corrective intervention. In Ayisi v Ghana Ports and Harbours Authority[2004] SCGLR 106 (Supreme Court) and Labour Act, 2003 (Act 651), Sections 118–120, the Court found that failure to establish and enforce proper safety supervision was a breach of the employer’s duty of care and that liability may exist in places of omission, where risks which could reasonably be anticipated in the workplace are not handled.

As such, prosecutors and regulators have been able to rely more heavily on documented supervisory inaction, such as ignored safety reports, unaddressed hazard notices, or repeated Behaviour-Based Safety (BBS) observations, in the determination of foreseeability and constructive knowledge, combined with supervisory neglect, in serious workplace injury or manslaughter cases based on omission.

4.3 Employer and Corporate Mens Rea

An employer may be negligent, or in aggravated cases, reckless, where organisational systems and controls fail to meet statutory safety obligations, including where:

- No adequate safety training or instruction exists, contrary to section 120 of the Labour Act, 2003 (Act 651);
- Work equipment or plant is unsafe or inadequately maintained, in breach of section 47 of the Factories, Offices and Shops Act, 1970 (Act 328);

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- Behaviour-Based Safety (BBS)–relevant behavioural hazards are identified but remain unaddressed; or
- Systemic failures in safety culture, supervision and enforcement are proven.

These factors establish organisational fault because they demonstrate that risks were foreseeable and preventable through reasonable managerial action. Under Ghanaian law, employer liability for workplace harm is grounded in failure to provide and enforce a safe system of work, with responsibility arising from omission where statutory duties are not discharged, particularly under sections 118–120 of the Labour Act, 2003 (Act 651). This statutory approach accords with contemporary regulatory and socio-legal analysis, which treats persistent safety failures as evidence of organisational negligence rather than isolated worker error (Parker & Nielsen, 2022).

Put together, this framework demonstrates that liability in Ghanaian workplace safety cases may properly attach at the organisational level where systemic deficiencies, rather than individual lapses, create and sustain foreseeable risks of harm.

4.4 Qualitative Findings: Organisational and Behavioural Patterns in Ghanaian Construction

Empirical studies consistently indicate that organisational and cultural factors, rather than isolated individual misconduct, account for the majority of unsafe acts in Ghanaian construction environments (Agyekum et al., 2022; Adzivor et al., 2024).

4.5Normalisationof Deviance, Foreseeability, and Organisational Mens Rea

This behavioural drift has practical consequences: it reduces individual risk awareness, alongside increases in organisational foreseeability and constructive knowledge. From a legal perspective, such behavioural drift undermines the grounds for attaching responsibility for recklessness to the individual who has a conscious appreciation of risk under section 13 of the Criminal Offences Act, 1960 (Act 29). Concurrently the continuance of visible and unaddressed hazards enhances organisational foreseeability, since it follows that supervisors and employers have a reasonable expectation to have been aware of risk, once it solidifies in a recurrent behaviour that violates their duty to supervise and ensure that foreseeable harm is not repeated, through such supervision and enforcement as is prescribed in sections 118–120 of the Labour Act, 2003 (Act 651).

Here, it has clear and legal significance in Ghanaian law because there is a statutory duty to regulate work organisation, ensure systems of work are kept safe, and prevent foreseeable risks arising from production demands (Labour Act, 2003 (Act 651), sections 118–122). These duties are underpinned by the Factories, Offices and Shops Act, 1970 (Act 328), which requires employers to keep workplaces, plant, and work processes safe and adequately maintained, irrespective of the production targets (Factories, Offices and Shops Act, 1970 (Act 328), sections 7, 47). Liability stems from failing to act, since employers and supervisors generally, under law, should have a reasonable knowledge of the potential risk and act proactively to prevent it if they feel the pressure is going to cause that unmitigated unsafe behaviour with organisational systems incapable of fixing or controlling that threat (Criminal Offences Act, 1960 (Act 29), section 13).

4.6 Negative Safety Climate, Informality, and Supervisory Omission

Within the law of this kind of supervision, this lack of oversight amounts to constructive knowledge when concerns become objectively visible through repeated unsafe behaviour or observable deviations from established safety measures, with the supervisors' knowledge that was reasonable to have been known once continued and/or repeated over time (Criminal Offences Act, 1960 (Act 29), s. 13). This objective awareness standard is further supported by the statutory workplace safety framework in Ghana, which places on supervisors and personnel managing workplaces positive duties to monitor, enforce, and correct unsafe behaviours (Labour Act, 2003 (Act 651), sections 118–120).

4.7 Behavioural–Legal Causation Model for Ghanaian Construction Accidents

The model combines two complementary analytical chains: Behaviour-Based Safety (BBS) behaviour chains, including antecedents, observed behaviour, and consequences, and legal causation chains, including duty of care, breach, foreseeability, harm, and the

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attribution of mens rea (Parker & Nielsen, 2022).

This would lead to courts being able to use the BBS-generated data, data-longitudinal behavioural trends, repeated unsafe acts performed, evidence of supervisory failure to intervene and patterns of systemic safety failure as the evidence for trial of fault in the courts (Labour Act, 2003 (Act 651), sections 118–120).

Legally, this drift of behaviours weakens the justification for attributing recklessness to an individual due to the repeated and visible hazards engaging the objective "ought reasonably to have known" standard within the meaning of section 13 of the Criminal Offences Act, 1960 (Act 29). In cases where these behaviours persist without corrective intervention – as in most cases – liability is based on culpable omission rather than isolated worker misconduct, thereby making for the evidence of structural, managerial or organisational negligence and, in more serious cases, organisational recklessness, as defined in sections 118–120 (Labour Act, 2003 (Act 651)).

The model thus shows that the behavioural evidence does not only represent dangerous conduct but is entirely consistent with the law testing of causation established in cases of negligence, recklessness and liability by an organisation based on the prescribed legislations for Ghana's statutory framework (Criminal Offences Act, 1960 (Act 29), section 13; Labour Act, 2003 (Act 651), sections 118–120). This Behavioural–Legal Causation Model can be visualised in **Figure 1.**

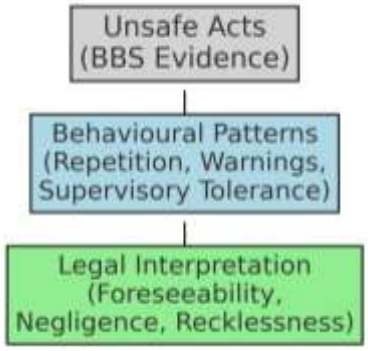

Figure 1. Behavioural–Legal Causation Model.

4.8GhanaianConstructionLiability Assessment Framework (Three-Tier Model)

Using this model, investigators can now access Behaviour-Based Safety (BBS) observation logs to document repeated unsafe acts, supervisory responses, and a continuous pattern of non-intervention over time, thereby collecting systematic data on exposure to workplace risk (Labour Act, 2003 (Act 651), sections 118–120). Courts, subsequently, may examine evidence of employee behaviour compared to the prescribed legal standards of duty of care and foreseeability to ascertain what the obligations of a worker, supervisor, or employer were as contained within Ghanaian law (Criminal Offences Act, 1960 (Act 29), section 13; Labour Act, 2003 (Act 651), sections 118–120). This systematic integration allows legal analysts to derive that behaviour from the observable by turning the actual behaviour into facts such as knowledge, omission and legal obligation (Criminal Offences Act, 1960 (Act 29), section 13). In turn, the framework gives courts a uniform evidentiary path to linking repeated workplace conduct with duty, breach, foreseeability, harm, and culpability in negligence and organisational liability judgments (Labour Act, 2003 (Act 651), sections 118–120; Criminal Offences Act, 1960 (Act 29), section 13).

The framework operationalises this assessment through a three-tier model:

- **Tier 1 (Worker Level):** Was the conduct intentional, reckless, or negligent?
- **Tier 2 (Organisational Level):** Were supervisory practices, training, or safety culture deficient or permissive of unsafe behaviour?
- **Tier 3 (Legal Layer):** Which mens rea category is satisfied based on the combined behavioural and organisational evidence?

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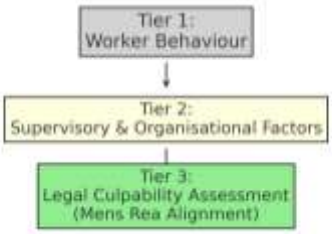

Figure 2. Three-Tier Liability Assessment Framework.

4.9 Evaluation of the Effectiveness of the Proposed Mechanism for Mens Rea Attribution

Its effectiveness can be evaluated through both its strengths and limitations, as outlined below.

4.9.1 Strengths of the Mechanism

(a) Strengthened Evidentiary Reliability

Behaviour-Based Safety (BBS) documentation provides continuous observational records, longitudinal behavioural trend data, and verifiable links between unsafe acts and supervisory responses, providing a more structured evidentiary foundation for legal analysis (Parker & Nielsen, 2011). These features enhance the reliability and probative value of evidence used to assess foreseeability and risk awareness, which are central to the attribution of negligence and recklessness under Ghanaian criminal law, particularly the objective "ought reasonably to have known" standard in section 13 of the Criminal Offences Act, 1960 (Act 29).

Behavioural evidence captured through BBS systems moves beyond anecdotal reconstruction. It becomes a structured evidentiary record capable of supporting legally cognisable inferences of knowledge, omission, and fault under sections 118–120 of the Labour Act, 2003 (Act 651).

(b) Clearer Differentiation Between Worker and Organisational Fault

By systematically mapping behavioural patterns onto legally recognised fault thresholds, the mechanism enables more precise differentiation between individual and organisational responsibility, particularly in regulated work environments where risk is shaped by organisational design rather than isolated conduct (Parker & Nielsen, 2011). In particular, the framework reduces inappropriate criminalisation of workers for unsafe acts that are shaped by cultural norms, informal labour arrangements, or inadequate training, which diminish subjective risk awareness and weaken the basis for attributing individual recklessness (Agyekum et al., 2022; Criminal Offences Act, 1960 (Act 29), section 13). At the same time, the mechanism strengthens the attribution of liability to supervisors and organisations where unsafe systems of work persist uncorrected, because repeated and visible hazards engage the objective "ought reasonably to have known" standard under Ghanaian law (Labour Act, 2003 (Act 651), sections 118–120; Criminal Offences Act, 1960 (Act 29), section 13).

The mechanism improves fairness and accuracy in criminal and civil liability assessments by aligning behavioural evidence with statutory fault standards governing negligence, recklessness, and omission (Parker & Nielsen, 2022; Labour Act, 2003 (Act 651), sections 118–120).

(c) Improved Predictability and Consistency in Legal Interpretation

Lack of evidentiary capacity or interpretation, particularly when accident investigations rely on post-incident narratives that offer limited insight into pre-existing behavioural patterns and organisational practices, tends to make it difficult for courts to infer intention, recklessness, or negligence (Parker & Nielsen, 2022).

Specifically, the proposed mechanism meets this challenge by offering explicit behavioural indicators tied to legal categories of fault, allowing the examination of behavioural evidence against the standards of statutory negligence and recklessness (Criminal Offences Act, 1960 (Act 29), section 13).

It adds to the established framework for determining foreseeability and constructive knowledge by basing legal analysis on observable behavioural repetition and supervisory inaction, as opposed to personal recollection following such an occurrence (Labour Act, 2003 (Act 651), sections 118-120; Criminal Offences Act, 1960 (Act 29), section 13).

It provides a consistent path that harmonises behavioural evidence with judicial causation and fault tests to minimise judicial variance, and contribute to evidentiary consistency in relation to criminal and civil liability (Parker

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& Nielsen, 2022; Labour Act, 2003 (Act 651), sections 118–120).

(d) Enhanced Safety Management and Organisational Learning

In addition to liability attribution, embedding Behaviour-Based Safety (BBS) information into investigative and legal processes also gives rise to institutional drivers for better safety management and organisational learning through the visibility, auditability and regulatory oversight of unsafe patterns (Parker & Nielsen, 2022; Labour Act, 2003 (Act 651), ss. 118–120).

In particular, this integration would force organisations to invest in supervision, training and induction systems, behavioural observation in real time, modify unsafe norms in real-time before they become integrated into normalised deviant behaviours—as evidenced by Ghanaian construction safety studies that demonstrated the link between organisational controls and the attainment of behavioural results (Agyekum et al., 2022; Labour Act, 2003 (Act 651), section 120).

Thus, the mechanism is the post-incident accountability tool and a preventive driver of risk, which aligns with the preventive objectives of occupational safety regulation and labour law by directing organisational attention away from reactive compliance and towards the proactive control of hazards (Labour Act, 2003 (Act 651), sections 118–120; Parker & Nielsen, 2022).

4.9.2 Weaknesses and Practical Limitations

(a) Potential Variability or Manipulation of BBS Data

Not all construction companies in Ghana are equally systematic about capturing Behaviour-Based Safety (BBS) data, and have reliable observation logs and, in some instances, appropriate training of observers in small and informal construction, where structures for safety are weakly institutionalised (Agyekum et al., 2022; Labour Act, 2003 (Act 651), section 120). A study in Ghanaian construction safety management suggests that informal labour, cost pressures, and low organisational capability often lead to fragmented, partial, or uneven reporting of behavioural data, thereby weakening the effectiveness of systematic safety monitoring (Agyekum et al., 2022; Parker & Nielsen, 2022).

If the quality of the information differs between projects or between companies, courts may reasonably doubt the reliability, impartiality, and completeness of BBS records to construe negligence or recklessness, consistent with relevant statutory fault standards which require objective foreseeability and reliable proof of knowledge or omission (Criminal Offences Act, 1960 (Act 29), section 13; Parker & Nielsen, 2022).

(b) Limited Judicial Familiarity With Behavioural Science Evidence

In Ghana, the use of expert and technical evidence in criminal and regulatory cases is lawful. Still, the majority of judges, prosecutors and investigators are unfamiliar with some behavioural science methodologies and their application in the legal fault assessment, particularly in a regulated work context (Criminal Offences Act, 1960 (Act 29), section 13; Parker & Nielsen, 2022).

Moreover, restricted institutional exposure to Behaviour-Based Safety concepts/knowledge, behavioural drift and socio-cognitive risk models may limit judicial readiness to rely on behavioural evidence, unless it is purposefully constructed and explicitly aligned to established legal tests of foreseeability, constructive knowledge, and culpable omission (Labour Act, 2003 (Act 651), sections 118–120; Parker & Nielsen, 2022).

Therefore, behavioural evidence may be undervalued or only considered as ad-hoc or supplementary unless it is translated into legally cognisable indicators that match statutory fault thresholds relating to negligence and recklessness under Ghanaian laws (Criminal Offences Act, 1960 (Act 29), section 13; Labour Act, 2003 (Act 651), sections 118–120).

(c) Risk of Over-Reliance on Worker Behaviour

To the extent that the proposed programme seeks to focus on organisational and supervisory fault, the poorly implemented or selectively applied Behaviour-Based Safety (BBS) systems could still predispose investigations to focus on individual worker behaviour, particularly where practices of observation lack consistency and supervisory accountability (Agyekum et al., 2022; Labour Act, 2003 (Act 651), sections 118–120).

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There exists an additional danger that the blame can be placed on the workforce that has lacked sufficient risk knowledge on the grounds of poor training, lack of supervision or production pressure and not intentional non-compliance, and liability attribution misaligned with statutory fault criteria (Agyekum et al., 2022; Criminal Offences Act, 1960 (Act 29), section 13).

It is, therefore, for the regulatory system to provide oversight and interpretative clarity to compel that behavioural evidence is used in a way that is aligned with systemic, and not only individualised, explanatory purpose, and that employer and supervisory duties which should prevent foreseeable risk exist in Ghana's workplace safety and labour regime (Labour Act, 2003 (Act 651), sections 118–120; Parker & Nielsen, 2022).

4.9.3 Overall Assessment of Effectiveness

The proposed mechanism further enhances mens rea attribution by bringing in structured and empirically grounded behavioural evidence to explain cognitive fault thresholds, in particular negligence and recklessness, by reference to what an accused person or organisation knew or ought reasonably to have known under Ghanaian criminal law (Criminal Offences Act, 1960 (Act 29), section 13; Parker & Nielsen, 2022).

By correlating behavioural data to a set of established legal causation tests, duty, breach, foreseeability, harm, and omission, the mechanism enhances accountability whilst also advancing safer organisational systems in conformity to statutory safety responsibilities (Labour Act, 2003 (Act 651), sections 118–120; Criminal Offences Act, 1960 (Act 29), section 13).

Yet, to some extent, its practicability is held back by variable implementation of Behaviour-Based Safety (BBS) in Ghanaian construction firms, a lack of institutional familiarity in the legal context towards the use of behavioural science evidence, and the absence of regulatory frameworks that both require and standardise behavioural data collection and use (Agyekum et al., 2022; Parker & Nielsen, 2022).

If coupled with regulatory reform that included modifications to the Labour Act, establishment of formal behavioural-evidence guidelines, and the provision of specialised judicial and prosecutorial training, the mechanism would be a high-impact intervention aimed at not only enhancing legal outcomes, but also safety management in Ghana's construction industry (Labour Act, 2003 (Act 651), sections 118–120; Parker & Nielsen, 2022).

4.10 Counterarguments and Alternative Interpretations

Yet, the hybrid framework proposed here reduces this risk by demanding that supervisory practice be critically appraised. Safety within the organisation is systematically analysed before fault attribution to ensure that liability analysis considers systemic causation rather than individual fault (Agyekum et al., 2022; Labour Act, 2003 (Act 651), sections 118–120).

Another challenge is that behavioural observation logs may be missing, selectively reported, or inconsistently kept, especially in informal or poorly controlled construction contexts, raising concerns about the reliability of the evidence (Agyekum et al., 2022; Parker & Nielsen, 2022).

The current issue indicates that stringent regulatory control standards are mandated to be met in relation to the gathering, verifying and utilising of safety monitoring of behaviours, a requirement established as part of statutory obligations for employers or supervisors to employ sound safety systems and record keeping as a source of evidence of compliance (Labour Act, 2003 (Act 651), sections 118–120).

Another critique is that courts might not have the institutional capability or knowledge to give practical consideration to behavioural safety data without formal analysis, especially when the evidence involves longitudinal patterns rather than isolated incidents (Parker & Nielsen, 2022).

Under Ghanaian law, however, courts have the right to depend upon expert and technical evidence where it will assist in the determination of foreseeability, knowledge, and causation, where such evidence does so through a clear connection to the thresholds of statutory fault affecting negligence and recklessness (Criminal Offences Act, 1960 (Act 29), section 13; Labour Act, 2003 (Act 651), sections 118–120).

Thus, the principled inclusion of behavioural-safety expertise is applicable in contexts where it helps the court to assess constructive

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knowledge, omission, and organisational contribution to risk rather than simply replacing legal judgment with behavioural science (Parker & Nielsen, 2022).

5. Conclusion

5.1 Key Conclusions and Practical Implications

Using the principles of turning recurring behavioural phenomena into legally intelligible indicators of foreseeability, omission, and organisational fault, this study offers courts and regulators a factual and evidence-based method for assessing mens rea when construction accidents occur within the framework of Ghanaian law and grounded in objective awareness and statutory duty instead of speculation (Criminal Offences Act, 1960 (Act 29), section 13; Labour Act, 2003 (Act 651), sections 118–120).

5.2 Future Research Directions and Limitations

Further efforts should be made to examine further empirical work on the operationalisation of Behaviour-Based Safety (BBS) systems and their interface with regulatory and accountability mechanisms in Ghana's construction industry and related jurisdictions. Despite the conceptual and doctrinal basis of this work, establishing a reference point for the employment of behavioural evidence in mens rea enquiry, large-scale empirical validation would have been impossible due to the scarcity of Ghana-based BBS datasets. Extended field studies might provide a mechanism for systematically testing how behaviour logs, observation records, and supervisory responses are written, interpreted, and utilised in investigative and enforcement settings (Li et al., 2024; Parker & Nielsen, 2022).

Future research must also consider how cultural, organisational and socio-economic determinants shape unsafe behaviour and its association with adverse legal consequences. Current Ghanaian construction safety research shows that organisational culture, informal labour relations, and production pressures significantly impact safety behaviour and the normalisation of risk on construction sites (Agyekum et al., 2022). But there is still little socio-legal research that focuses on how these determinants shape courts' understanding of foreseeability, negligence, and organisational fault. Consequently, future interdisciplinary research may deepen understanding of how culturally normalised unsafe practices alter the attribution of mens rea and shift liability from individuals to institutions (Parker & Nielsen, 2022).

5.3 Recommendations and Implementation Matrix

The following suggestions are derived from the doctrinal analysis and behavioural results of the study. They highlight the need for structured behaviour documentation, regulatory recognition of BBS principles, and the consistent application of empirical behavioural evidence in legal assessments of fault and mens rea in Ghana's construction sector.

And in tune with the reviewer's recommendations, the recommendations are organised by their implementability and expected effects, allowing regulators, courts, and industry actors to order the reforms they deem necessary within extant resource limitations.

Although integrating behavioural evidence into liability assessments is practical, several barriers to its use may still arise. Resistance toward regulatory transition, especially from industry actors worried about higher levels of compliance requirements. The implementation challenges are associated with institutional readiness, not the conceptual validity.

- Costs associated with investigator and judicial training in behavioural safety analysis.
- Concerns regarding data quality, standardisation, and potential manipulation of behavioural logs.

To address these challenges, the study proposes:

- A **phased rollout** of BBS documentation requirements, beginning with high-risk or large-scale projects.
- **Stakeholder engagement** involving judges, prosecutors, regulators (DFI, Minerals Commission, Labour Department), employers, and unions to build institutional legitimacy.
- Development of **national minimum standards** for BBS data collection, verification, and retention to safeguard evidentiary reliability.

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Decision-makers are encouraged to prioritise high-impact, low-cost interventions before progressing to more resource-intensive statutory reforms.

Table 2: Implementation Matrix (Impact vs Feasibility)

High-Impact / Low-Cost	Mandate Behaviour-Based Safety (BBS) documentation for large construction projects as part of project approval and site compliance	Ministry of Employment & Labour Relations; Labour Department; Environmental Protection Agency (EPA); Project-Approving Authorities	Labour Act, 2003 (Act 651), ss. 118–120; Factories, Offices and Shops Act, 1970 (Act 328)	Very High	Low
High-Impact / Low-Cost	Courts to recognise properly documented BBS logs as admissible evidence relevant to foreseeability, omission, and *mens rea*	Judiciary; Prosecutors	Criminal Offences Act, 1960 (Act 29), s. 13; Evidence Act, 1975 (NRCD 323); judicial principles on foreseeability and omission	Very High	Low
High-Impact / Medium-Cost	Train accident investigators and labour inspectors to identify, document, and interpret behavioural safety evidence	Labour Department; Minerals Commission; EPA	Administrative and inspection powers under Act 651 and sector-specific safety regulations	High	Medium
Medium-Impact / Medium-Cost	Require safety-climate and behavioural-risk audits during project approval and periodic inspections	Metropolitan, Municipal and District Assemblies (MMDAs); Labour Department; EPA	Act 651; Local Governance Act, 2016 (Act 936); Act 328	Medium	Medium
Medium-Impact / High-Cost	Amend the Labour Act to include explicit duties relating to organisational safety culture, behavioural controls, and supervisory accountability	Parliament; Ministry of Employment & Labour Relations	Legislative reform (proposed amendment to Act 651)	Medium	High

Implementation Logic

The implementation matrix shows that significant shifts in liability assessment and safety governance in Ghana's construction industry don't require legislation, as statutory competences have effectively enabled regulators and courts to act (Labour Act, 2003 (Act 651), sections 118–120).

Reform is achievable, in the short term, through administrative directives, judicial acknowledgement of properly documented Behaviour-Based Safety (BBS) records as admissible and relevant evidence and concerted training of current regulatory and enforcement institutions, all in line with the courts' well-established reliance on objective foreseeability and omission over formalistic evidentiary labels (Criminal Offences Act, 1960 (Act 29), section 13; Evidence Act, 1975 (NRCD 323)).

Reform, such as changes to the Labour Act, 2003 (Act 651) that give specific recognition of organisational safety culture, supervisory accountability, and behavioural-control duties is therefore considered a medium-term to long-term reform that starts when institutional understanding of behavioural evidence becomes more solid, and legal relevance becomes more mature (Act 651, sections 118–120; Parker & Nielsen, 2022).

This matrix, by ordering recommendations by their impact and feasibility, affords regulators, courts and industry agencies a pragmatic

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guideline for integrating behavioural evidence into accident investigation, prosecution and adjudication by preserving enforcement ability and tying in liability attribution to systemic causation as opposed to individual worker mistake (Act 651, sections 118–120; Act 29, s. 13; Parker & Nielsen, 2022)..

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