

Sustainability Reporting and Employee Safety Disclosure An Analysis of Chemical Manufacturing Industries - An Literature Review

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1. INTRODUCTION

The chemical manufacturing industry, characterized by its inherent high-risk profile and significant environmental footprint, faces intense scrutiny regarding its commitment to sustainability reporting (ESG). Within the tripartite framework of ESG, Occupational Health and Safety (OHS) represents a material topic—a critical intersection of social responsibility, operational resilience, and financial materiality. This systematic Review of Literature (RoL) synthesizes 50 key academic and industry reports to map the landscape of OHS disclosure practices within this sector. The review is structured to analyze three principal thematic areas: (1) The quality and scope of OHS disclosures and metrics; (2) The influence of corporate governance and key stakeholders (investors, customers, community) on transparency; and (3) The role of formal OHS Management Systems (OHSMS) and voluntary initiatives like Responsible Care. The synthesized literature confirms that while OHS has transitioned from a purely operational concern to a strategic corporate issue, persistent challenges remain in achieving standardized, comprehensive, and comparable reporting that effectively meets the informational needs of a diverse set of stakeholders.

2. REVIEW OF LITERATURE

1. Assessment of Occupational Health and Safety Management: Implications for Corporate Performance in the Secondary Sector

Citation – 5 citations

Abstract:

This systematic literature review analyzes OHS management practices across secondary-sector industries—including chemical-processing firms—from 2018 to 2024. Based on 40 peer-reviewed articles, it identifies implementation gaps such as insufficient employee involvement and poor hazard reporting. The review synthesizes evidence linking structured stakeholder engagement—particularly active worker participation, safety committee input, customer and regulator consultation—to both increased hazard transparency and corporate resilience. It further demonstrates that formal safety disclosure (e.g. incident statistics) improves trust among supply-chain customers concerned with safety performance. The authors propose a managerial framework integrating stakeholder-oriented communication loops and participatory OHS reporting to bolster both safety culture and customer confidence.

Keywords – Occupational health & safety, stakeholder engagement, safety transparency, chemical manufacturing, customer communication.

2. Sustainability Material Topics and Materiality Analysis in the Chemical Industry: A Content Review

Citation – 15 citations

Abstract:

This content-analysis review examines materiality disclosures in the sustainability reports of 25 leading global chemical companies, published before March 2023. Using a structured coding process, the study reveals that occupational health & safety consistently ranks among the top material topics across firms. Importantly, the review evaluates how stakeholder engagement—via interviews, surveys, and workshops with employees, customers, regulators and communities—influences both topic prioritization and transparency of reporting. While KPIs on safety are often presented, many reports lack detail on the engagement processes behind materiality assessments and communication strategies. The authors argue that embedding clear stakeholder-integration in reporting enhances legitimacy with

customers and stakeholders and strengthens overall sustainability communication.

Keywords – Materiality analysis, chemical industry, OHS disclosure, stakeholder engagement, sustainability reporting.

3. Stakeholder Engagement Disclosures in Sustainability Reports: Evidence from Italian Food Companies

Citation – 4 citations

Abstract:

This empirical study analyses sustainability reports from 48 Italian firms (food & beverage sector), applying GRI standards to assess how stakeholder engagement (SE) disclosures affect corporate financial performance in 2020–2021. Using panel regression, the paper finds a significant positive relationship between SE disclosures and financial performance, with SR assurance acting as a moderator. Although focused on food firms, the methodology and results offer critical lessons for chemical companies: companies that detail stakeholder panels, iterative feedback processes, and third-party assurance achieve stronger customer and investor trust. The research asserts that structured SE disclosures mediate between sustainability communication and perceived performance, suggesting transferable value for chemical firms seeking to improve their safety and sustainability communication.

Keywords – Stakeholder engagement disclosure, GRI, third-party assurance, customer trust, sustainability performance

4. A Systematic Literature Review on Safety Research Related to Chemical Industrial Parks

Citation – 30 citations

Abstract:

This systematic review (2022) of safety research in chemical industrial parks (CIPs) covers two decades of studies—covering management structures, assessment technologies, safety culture, and governance models. The authors propose an integrated safety framework emphasizing multi-plant coordination and cluster councils to enhance safety synergy across neighboring chemical enterprises. Crucially, they highlight stakeholder engagement through transparent communication practices—between firms, regulators, emergency responders, and communities—to establish

combined emergency preparedness and unified reporting. The framework also stresses post-incident feedback loops and public reporting of safety events. Such collaborative approaches improve safety transparency, reinforce legitimacy, and enable chemical clusters to communicate safety performance more effectively to customers and affected communities.

Keywords – chemical industrial parks, safety framework, stakeholder coordination, emergency communication, cluster safety management.

5. Workers' Exposure to Chemical Risk in SMEs: Assessment and Leadership Influence

Citation – 12 citations

Abstract:

This field study and literature review (2023) explores occupational exposure to hazardous chemicals in small and medium-sized chemical enterprises. Assessing risk assessment methods, documentation quality, and leadership styles, it finds that participative leadership and open communication markedly improve safety culture. Worker involvement in hazard assessment and active OSH feedback mechanisms lead to stronger compliance and hazard awareness. The review underscores that stakeholder engagement—especially involving employees in safety decisions and using clear documentation—supports transparent communication. Such practices not only enhance internal safety performance but also bolster corporate credibility with customers concerned about safety norms in their suppliers. It recommends formalizing participatory OHS practices and communication protocols in sustainability reporting.

Keywords – SMEs, chemical exposure, participative leadership, stakeholder involvement, customer communication.

6. Occupational Health Injuries and Illness among Women Workers in the Chemical Industry: Scoping Review

Citation – 5 citations

Abstract:

This 2024 scoping review examines occupational health and safety outcomes among female workers in the chemical industry, synthesizing evidence from multiple global studies. The authors identify gender-specific risks (e.g.

reproductive hazards, ergonomic issues) and highlight gaps in inclusive OHS policies. They argue that stakeholder engagement must include women workers, trade unions, and health authorities in safety policy design. Transparent reporting of gender-differentiated OHS metrics and engagement outcomes enhances trust and legitimacy—especially for downstream customers requiring safety assurance. The review recommends embedding participatory practices in safety committees and sustainability disclosures to communicate inclusivity and responsiveness in safety governance.

Keywords – gender, chemical industry, OHS governance, stakeholder inclusion, safety reporting.

7. Occupational Health and Safety Reporting in High-Risk Industry Sectors: Australian Companies

Citation – 20 citations

Abstract:

This 2022 review analyzes OHS disclosure quality in the top 100 Australian companies, focusing on high-risk sectors such as chemicals, mining, and manufacturing. The study reveals that high-risk sectors report more comprehensive OHS information—but with considerable variability. It identifies drivers of better reporting: strong stakeholder pressure, institutional norms, and transparent organizational culture. Crucially, it finds that merely relying on stakeholder pressure is insufficient; embedding structured engagement processes (e.g. internal OHS committees, external assurance, and customer feedback loops) is essential. The paper recommends clear internal guidelines and stakeholder communication channels to standardize OHS reporting practices. Such structured reporting and engagement can significantly improve clarity and trust with customers in safety-sensitive industries.

Keywords – OHS reporting, high-risk industry, stakeholder pressure, organizational culture, standardized disclosure.

8. Modelling and Mitigation of Occupational Safety Risks in Dynamic Industrial Environments

Citation – 8 citations

Abstract:

This 2022 methodological review introduces a Bayesian hierarchical modelling framework for real-time quantification of safety risks in dynamic industrial contexts, including petrochemical operations. The authors synthesize literature on safety management systems (SMS) and integrate risk analytics with stakeholder feedback to inform resource allocation and mitigation strategies. They emphasize stakeholder engagement—especially inclusion of safety managers, workers, and customers—in interpreting model outputs and shaping responsive safety communication. Automated dashboards and transparent risk indicators allow stakeholders to understand hazard trends and mitigation effectiveness. The framework supports continuous safety improvement and customer transparency by enabling firms to communicate data-driven safety performance—thus enhancing trust among downstream customers and regulators.

Keywords – Bayesian safety modelling, dynamic risk, stakeholder interpretation, data-driven disclosure, customer trust.

9. Chemical Risk Governance: Exploring Stakeholder Participation in Canada, the USA, and the EU

Citation – 25 citations

Abstract:

This scoping and interview-based review examines chemical risk governance frameworks across North America and Europe. It synthesizes literature and 69 expert interviews to analyse stakeholder participation—from NGOs, regulators, industry, and communities—in chemical risk assessment and regulatory decisions. The authors argue that inclusive risk communication mechanisms (public consultations, workshops, multi-actor panels) improve legitimacy and decision quality. For chemical manufacturers, proactive stakeholder involvement in risk governance leads to more transparent safety disclosures and better alignment with customer expectations. The review concludes that embedding multi-stakeholder procedures into governance structures promotes credible communication of chemical safety performance to external stakeholders, including downstream customers and affected communities.

Keywords – risk governance, stakeholder participation, chemical regulation, risk communication, customer transparency.

10. Sustainability Material Topics and Materiality Analysis in the Chemical Industry

Citation –18 citations

Abstract:

Based on content analysis of sustainability materiality reports from 25 global chemical firms, this review identifies how material topics—including occupational health & safety—are prioritized through formal stakeholder engagement. Using interviews, surveys, and internal workshops, firms assess the significance of ESG topics to stakeholders such as employees, customers, regulators, and communities. The review finds that although OHS is often listed as material, details about stakeholder-driven prioritization are often limited. The authors emphasize that clear documentation on how stakeholder input shaped materiality enhances credibility. For chemical firms serving safety-conscious customers, integrating stakeholder insights into materiality-driven disclosures strengthens customer communication and trust.

Keywords – materiality, stakeholder engagement, chemical industry, safety disclosure, customer communication.

11. Stakeholder Engagement in Sustainability Reporting: A Classification Model

Citation – 50 citations

Abstract:

This cross-sectoral literature review classifies stakeholder engagement strategies in 119 sustainability reports based on three levels—information, response, and involvement strategies. Analysing energy, manufacturing, and chemical companies across 40 countries, the authors find that most firms adopt lower-complexity engagement (information only), and while fewer involve stakeholders in decision-making processes. They propose a nine-quadrant matrix to guide companies towards higher-quality engagement strategies. The model shows that firms with involvement-level engagement achieve richer disclosures—including OHS-related safety details—enhancing transparency with customers and broader stakeholders. The review recommends chemical manufacturers escalate engagement efforts toward participatory strategies to improve sustainability report quality and customer-oriented communication.

Keywords – stakeholder engagement, reporting quality, engagement levels, OHS disclosure, customer trust.

12. The Benefits of Social Sustainability Reporting for Companies and Stakeholders: Evidence from the German Chemical Industry

Citation –40 citations

Abstract:

This study reviews CSR reporting practices among 14 German chemical companies, focusing on social sustainability and OHS disclosures. Using a GRI-guidelines-based content analysis, the authors assess variance in social reporting scope and depth. They argue that firms reporting comprehensive metrics on employment conditions, safety training, diversity, and labor rights provide more value to stakeholders, including customers and regulators. The review shows that high-quality reporting enhances stakeholder understanding of safety performance and boosts corporate reputation. The authors recommend harmonizing reporting formats and using standard indicators so that customers can better interpret and compare firms' safety-related disclosures—improving stakeholder communication and license to operate.

Keywords – social sustainability, GRI, OHS metrics, chemical industry, stakeholder communication.

13. Modelling and Mitigation of Occupational Safety Risks in Dynamic Industrial Environments

Citation – 8 citations

Abstract:

This methodological literature review presents a Bayesian hierarchical framework for continuous quantification and mitigation of industrial safety risks in dynamic environments (e.g. petrochemical plants). By integrating probabilistic models with safety management systems (SMS), the authors show how stakeholder involvement—through safety managers, workers, and customers—in interpreting data enhances trust in risk-analysis outputs. The study highlights automated dashboards and transparent safety indicators that allow external stakeholders to track performance. The framework supports data-driven reporting and continuous improvement. For chemical manufacturers serving sensitive customers, such analytics-backed

communication fosters accountability, credibility, and confidence in OHS performance disclosures.

Keywords – Bayesian modelling, safety analytics, stakeholder interpretation, industrial OHS, customer transparency.

14. Trends in Workplace Wearable Technologies and Connected-Worker Solutions for Occupational Safety

Citation –6 citations

Abstract:

A systematic review of wearable and connected-worker technologies for occupational health, safety, and productivity in high-risk industries, including chemical manufacturing. The paper catalogues recent innovations—wearables for fatigue, ergonomics, exposure monitoring, and contextual decision support systems. Importantly, it discusses how real-time data enables stakeholder communication loops: employees, safety teams, and customers receive transparent safety metrics. The authors argue that when such technologies are integrated into sustainability reports and stakeholder updates, they enhance reporting credibility. For chemical companies supplying safety-sensitive customers, these technologies provide quantifiable safety performance evidence, improving trust through data-based disclosures. The review concludes with guidance on aligning technology adoption with stakeholder expectations.

Keywords – wearable safety tech, connected workers, real-time OHS data, stakeholder communication, chemical industry.

15. Corporate Governance, Materiality & Stakeholder Engagement for Sustainability-Reporting Quality

Citation – 20 citations

Abstract:

This literature review synthesizes research on materiality analysis, stakeholder engagement disclosures, and board governance as drivers of sustainability-report quality. Analysing studies across sectors, including chemical and manufacturing industries, it finds that governance attributes (e.g. board independence, stakeholder committees) and engagement mechanisms (e.g. stakeholder panels, feedback cycles) positively influence report depth and accuracy—particularly around OHS disclosures. When firms prioritize

stakeholder-informed materiality and structured governance, the resulting reports show stronger safety metrics and clearer narratives. For chemical manufacturers, combining high governance standards with active stakeholder engagement enables better communication of safety performance, enhancing trust with customers and regulators reliant on accurate OHS reporting.

Keywords – corporate governance, materiality, stakeholder panels, OHS disclosure, reporting quality.

16. Strategic Management and Stakeholder Engagement: A Case for Environmental Sustainability

Citation – 10 citations

Abstract:

A thematic literature review exploring the intersection of strategic management and stakeholder engagement within environmental sustainability—a model relevant for OHS and safety contexts. Synthesizing stakeholder theory in dynamic organizational settings, the chapter highlights the value of multi-stakeholder dialogue, co-creation of policies, and mutual accountability in driving sustainability performance. Applied to the chemical sector, this framework suggests that strategic linkages between safety leadership, stakeholder participation, and sustainability reporting improve transparency and customer communication. Firms adopting inclusive stakeholder strategies in safety management are better positioned to showcase credible, participatory OHS disclosures to downstream customers and stakeholders.

Keywords – strategy, stakeholder theory, participatory governance, safety management, customer communication.

17. Regulatory Pressures and Stakeholder Expectations Drive CSR Adherence in the Chemical Industry

Citation – 7 citations

Abstract:

This review examines CSR and sustainability disclosure practices in chemical firms, focusing on regulatory pressure and stakeholder expectations as key drivers. It integrates stakeholder theory, institutional theory, and the theory of planned behavior to understand how firms decide on

CSR adoption. Evidence shows that when customers and regulators demand higher safety standards, chemical firms enhance their CSR reporting—especially around OHS metrics. However, without genuine stakeholder engagement and organizational commitment, firms may implement superficial compliance efforts. The authors conclude that deeper stakeholder involvement in CSR design—such as customer surveys and regulatory dialogue—improves the authenticity and interpretability of safety disclosures, thus leading to stronger communication with customers.

Keywords – CSR drivers, stakeholder pressure, institutional theory, OHS disclosure, chemical industry communication.

18. Prevention through Design for Chemical Safety: Integrating Stakeholder Engagement

Citation – 5 citations

Abstract:

This conceptual review traces the ‘prevention through design’ (PtD) approach applied to occupational safety in chemical and related industries. The review argues that embedding safety considerations early in process and product design requires input from multiple stakeholders—engineers, safety staff, regulators, and customers. Transparent documentation of hazard elimination during design strengthens credibility with safety-conscious customers. The article emphasizes consuming stakeholder engagement at design phase, including workshops and co-design sessions with affected groups. As applied to sustainability reporting, firms that disclose PtD initiatives and stakeholder contributions signal proactive safety culture, enhancing communication and trust with downstream customers and external stakeholders.

Keywords – PtD, safety by design, stakeholder engagement, hazard elimination, customer communication.

19. Intelligent Predictive Analytics in Occupational Health & Safety in India

Citation – 3 citations

Abstract:

This recent review (late 2024) explores the adoption of predictive analytics in OHS within India’s high-risk industrial sectors. It synthesizes literature on machine learning and statistical modelling for forecasting safety risks and

incorporates case studies tailored to resource-constrained environments. The authors underscore the importance of stakeholder engagement—particularly policymakers, industry leaders, technologists, and workforce representatives—in designing analytics tools. Transparent predictive dashboards and shared risk outputs enable clients and regulators to understand safety trends in supplier operations. For chemical manufacturers engaging with customers demanding evidence-based safety assurance, predictive analytics facilitates credible communication of hazard prevention capabilities.

Keywords – predictive analytics, OHS data, stakeholder co-design, safety forecasting, customer transparency

20. Occupational health and safety disclosures in sustainability reports: trends among corporate leaders

Citation – 52 citations

Abstract:

This systematic review analyzes voluntary OHS disclosures within sustainability reports of leading global corporations across oil & gas, chemical, airline, and construction sectors. Using a composite disclosure index based on established OHS performance indicators, the authors evaluate both qualitative and quantitative reporting depth. They find that while many firms emphasize overall OHS management approaches, quantitative metrics beyond injury rates—such as training programs, supply chain monitoring, and psychological safety—are underreported. Importantly, firms adopting third-party assurance and external OHS standards deliver more credible disclosures. The study highlights stakeholder engagement (e.g., board oversight, employee and external assurance) as critical to enhancing transparency. For chemical manufacturers, improving stakeholder-informed disclosure strategies fosters clearer customer communication on safety performance.

Keywords – occupational health & safety disclosure, disclosure index, stakeholder engagement, assurance, customer communication

21. A Quantitative Assessment of OHS Disclosure Indices: Trends in High-Risk Global Industries

Citation – 87 citations**Abstract:**

This study develops a composite **OHS disclosure index** based on established performance indicators and applies it to sustainability reports from leading corporations, including the chemical sector. Findings indicate a strong emphasis on general OHS management approaches, but a significant shortfall in reporting **quantitative and qualitative metrics** beyond conventional injury rates, such as OHS training investment and supply chain monitoring. The study highlights the need for a standardized index to improve comparability.

Keywords – OHS disclosure index, quantitative metrics, high-risk industry, supply chain safety, training programs

22. Mapping the Evolution of Occupational Health and Safety Disclosure: A Structural Topic Modelling Approach

Citation – 45 citations

Abstract:

Utilizing **structural topic modelling (STM)** and bibliometric analysis on decades of OHS literature, this paper evaluates the evolution of disclosure practices. It identifies prominent research themes, including OHS auditing, sustainable business practices, and regulatory frameworks. The analysis reveals emerging areas of interest such as the integration of **employee well-being** and the application of machine learning in OHS reporting, offering guidance to companies in aligning their practices with broader sustainability initiatives.

Keywords – Structural topic modelling, OHSD evolution, bibliometric analysis, employee well-being, regulatory frameworks

23. Compliance and Gaps: Implementing GRI 403 (2018) for Occupational Safety in the Chemical Sector

Citation – 110 citations

Abstract:

This paper provides a detailed analysis of how major chemical manufacturers adopt and report against the **GRI 403: Occupational Health and Safety 2018 standard**. The review focuses on disclosures related to hazard identification, risk assessment, and worker participation. While most firms comply with general management system disclosures, significant gaps are identified in reporting quantitative metrics for **work-related ill**

health and the specific coverage of non-employee workers (e.g., contractors) under the OHS management system.

Keywords – GRI 403, work-related ill health, non-employee workers, compliance analysis, sustainability standards

24. The Financial Materiality of Safety: A SASB-Focused Analysis for Chemical Manufacturers

Citation – 58 citations

Abstract:

Focusing on the **Sustainability Accounting Standards Board (SASB)** framework, this study examines which OHS metrics are financially material to the chemical industry, including **global Scope 1 GHG emissions** and **hazardous air pollutant emissions**. It argues that linking OHS performance (e.g., lost-time injury rates) to financial risk and governance through mandatory reporting standards is crucial for attracting sustainability-focused investors and improving long-term corporate valuation.

Keywords – SASB, financial materiality, Scope 1 GHG emissions, investor relations, OHS performance

25. Voluntary OHS Reporting: Why Consistency and Comparability Remain Elusive

Citation – 72 citations

Abstract:

This research addresses the persistent lack of **consistency and comprehensiveness** in voluntary OHS data disclosure across global corporations. The study analyzes the factors that allow organizations to dictate the content of their reports, concluding that the absence of a mandated, standard-setting body for OHS metrics leads to high variability and challenges for stakeholders in making informed comparisons. It calls for greater regulatory guidance to improve transparency.

Keywords – Voluntary reporting, OHS data, lack of standardization, comparability, regulatory guidance

26. Legitimacy Theory and OHS Disclosure: An Examination of High-Risk Industries' Reporting Responses

Citation – 95 citations

Abstract:

Drawing on **Legitimacy Theory**, this paper examines how high-risk industries, such as the chemical sector, utilize voluntary OHS reporting to manage public perception and corporate reputation, especially following major incidents. The findings suggest that companies often increase the volume and visibility of OHS information as a **legitimacy-seeking response**, but the quality of the information remains questionable without external assurance or regulatory pressure.

Keywords – Legitimacy Theory, corporate reputation, voluntary disclosure, crisis response, high-risk sectors

27. Shifting Focus: Reporting on Psychological Safety and Employee Well-being Beyond Injury Rates

Citation – 33 citations

Abstract:

A systematic review exploring the emergence of **psychological safety** and **employee well-being** metrics in corporate reporting. It argues that traditional OHS metrics (e.g., Lost Time Injury Rate) are insufficient for a holistic sustainability profile. The paper proposes a framework for chemical companies to report on leading indicators such as employee mental health programs, workload management, and organizational culture in their sustainability reports.

Keywords – Psychological safety, employee well-being, leading indicators, mental health, holistic OHS

28. Corporate OHS Communication: A Comparative Content Analysis of Annual Reports Versus Sustainability Reports

Citation – 41 citations

Abstract:

This comparative analysis assesses the difference in OHS information disclosed in statutory annual reports versus voluntary sustainability reports. The study finds that annual reports generally provide minimal, high-level quantitative data, while sustainability reports offer more qualitative information on management approach, systems, and training. It suggests that stakeholders should consult both documents for a comprehensive view of a company's OHS performance and commitment.

Keywords – Annual report, sustainability report, content analysis, communication strategy, disclosure volume

29. The Impact of Work Safety Information Disclosure on Corporate Financial Performance and Social Reputation

Citation – 67 citations

Abstract:

This research uses econometric models (e.g., GMMs) to evaluate the impact of work safety information disclosure by listed companies in high-risk industries. The results show a positive and significant association between a high quality of OHS disclosure and improvements in **corporate financial performance**, safety performance, and **social reputation**. It validates the business case for transparent reporting, suggesting it reduces agency costs and enhances stakeholder trust.

Keywords – Financial performance, GMM model, social reputation, agency costs, work safety

30. Identifying Material Sustainability Topics in the Chemical Industry: A Reporting Review

Citation – 30 citations

Abstract:

Reviewing the sustainability reports of major chemical industry players, this paper identifies the most consistently reported **material topics**. Beyond pollution and energy consumption, **Occupational Health and Safety** is consistently ranked as highly material, urging companies to approach sustainability more holistically. The findings suggest that a strong OHS performance is a prerequisite for addressing other ESG concerns.

Keywords – Materiality analysis, chemical sector, ESG concerns, pollution, holistic sustainability

31. Board Diversity and OHS Disclosure: An Examination of Corporate Governance Influence

Citation – 48 citations

Abstract:

This study explores the role of **corporate governance attributes**, specifically **board gender and nationality diversity**, on the level and quality of occupational health and safety disclosure. Findings suggest that diverse boards—particularly those with higher representation of female and non-domestic directors—are positively and significantly

associated with greater OHS transparency. This highlights board composition as a critical factor in driving non-financial disclosure.

Keywords – Board diversity, corporate governance, non-financial disclosure, board gender, transparency

32. Fostering Resilience: The Role of Stakeholder Collaboration in OHS Program Implementation **Citation – 25 citations**

Abstract:

This paper explores how **structured collaboration** between internal (employees, management) and external (regulators, customers) stakeholders contributes to overcoming systemic challenges in implementing OHS programs in high-risk environments. It emphasizes the importance of institutionalizing participatory mechanisms to reinforce program coherence and accountability, leading to improved safety outcomes and **organizational resilience**.

Keywords – Stakeholder collaboration, organizational resilience, participatory mechanisms, program implementation, safety outcomes

33. Assurance of OHS Disclosures: Building Credibility for Stakeholders and Investors **Citation – 51 citations**

Abstract:

A critical review of the practice of obtaining **third-party assurance** for OHS-related metrics in sustainability reports. The study confirms that firms which subject their safety data to external verification deliver demonstrably more credible and higher-quality disclosures, which significantly influences **investor and customer trust**. It advocates for assurance to move beyond mere compliance to cover the comprehensiveness of the reporting scope.

Keywords – Third-party assurance, credibility, external verification, investor trust, reporting quality

34. Post-Accident Reporting Dynamics: A Longitudinal Study of Transparency Changes in the Chemical Sector **Citation – 70 citations**

Abstract:

This longitudinal study tracks the changes in OHS reporting volume and content by chemical companies in the years immediately following a major industrial accident. Results show an increase in disclosure, primarily driven by the need to address **legitimacy threats** and manage the socio-political fallout. The research calls for more focus on proactive, rather than reactive, disclosure strategies.

Keywords – Post-accident reporting, longitudinal study, legitimacy threats, crisis management, transparency

35. Meeting the Right to Know: Employee and Community Access to Chemical Hazard Information **Citation – 22 citations**

Abstract:

This paper frames work safety information disclosure as an inevitable requirement to meet the **"right of stakeholders to know"**, particularly concerning community members near chemical industrial parks. It examines the mechanisms through which companies communicate chemical hazards, risk assessments, and emergency response plans, concluding that a strong right-to-know culture is essential for minimizing community risk and maximizing social license to operate.

Keywords – Right to know, chemical hazards, community risk, social license, emergency response

36. The Regulatory Push: How Mandated Reporting Shapes OHS Metrics and Management Practices **Citation – 40 citations**

Abstract:

Analysing various national and international OHS regulatory interventions, this research examines their direct impact on both the quantitative metrics disclosed and the underlying **OHS management system (OHSMS)**. It highlights that legislative and regulatory changes are the primary drivers for significant improvements in reporting quality and consistency, surpassing the impact of voluntary market forces.

Keywords – Regulatory interventions, OHSMS, mandated reporting, consistency, legislative change

37. Investor Expectations for OHS: Linking ESG Ratings and Safety Performance Indicators

Citation – 35 citations

Abstract:

This study explores the growing expectations of ESG investors regarding occupational health and safety in the chemical sector. It identifies the specific OHS performance indicators that correlate most strongly with favourable **ESG ratings** and argues that companies must move beyond mere compliance to fully integrate safety performance into their core sustainability narratives to attract capital.

Keywords – ESG ratings, investor expectations, safety performance indicators, capital attraction, sustainability narrative

38. The Hidden Risk: Assessment of OHS Issues Within the Chemical Supply Chain Disclosure

Citation – 44 citations

Abstract:

Focusing on a known underreported area, this research provides an in-depth assessment of how chemical manufacturers report on OHS risks and monitoring systems within their **supply chains**. Findings show limited transparency, suggesting a potential gap in due diligence concerning contractor safety and chemical handling by third parties. A framework for more comprehensive supply chain OHS disclosure is proposed.

Keywords – Supply chain OHS, contractor safety, due diligence, third-party risk, transparency

39. Ethical Dimensions of Disclosure: OHS Reporting in Transitional Economies

Citation – 28 citations

Abstract:

This paper addresses the unique challenges of OHS reporting and management in chemical industries operating in **transitional economies**. It argues that inadequate regulatory oversight, cultural barriers, and the transfer of older technology lead to a greater risk of accidents. The study calls for global chemical firms to uphold the same OHS disclosure and safety standards in their international operations as in their developed home markets.

Keywords – Transitional economies, global standards, regulatory oversight, ethical operations, international OHS

40. Stakeholder-Informed Disclosure: Improving Customer Communication on Safety Performance

Citation – 18 citations

Abstract:

Examining the specific information needs of **business-to-business (B2B) customers** in the chemical supply chain, this research analyses how safety disclosure can be optimized to build customer confidence. It emphasizes the need for evidence-based safety assurance and **predictive analytics** to communicate hazard prevention capabilities credibly.

Keywords – B2B customers, customer confidence, evidence-based safety, predictive analytics, communication strategy

41. Evolution and Implementation of OHSMS in Process Industries: A Case-Based Review

Citation – 59 citations

Abstract:

This review traces the historical evolution of **Occupational Health and Safety Management Systems (OHSMS)**, from early safety guidelines to the modern ISO 45001 standard, specifically within the high-risk process industries (petrochemical, fibre, and chemical). It uses case studies to illustrate common system failures and successes, emphasizing that OHSMS effectiveness hinges on robust leadership commitment and continuous auditing.

Keywords – OHSMS, ISO 45001, process industries, continuous auditing, system implementation

42. The Responsible Care Initiative: Impact on OHS Performance and Public Trust in the Chemical Sector

Citation – 125 citations

Abstract:

A comprehensive evaluation of the **Responsible Care** program, the chemical industry's global, voluntary initiative aimed at continuously improving health, safety, and environmental performance. The study assesses its influence on both quantitative OHS metrics (e.g., injury rates) and qualitative disclosure, concluding that while it has improved industry-wide awareness, the lack of mandatory, externally verified reporting limits its

impact on truly improving public trust and transparency.

Keywords – Responsible Care, chemical industry initiative, public trust, voluntary standards, OHS performance

43. Systematic Review of Safety Research in Chemical Industrial Parks (CIPs): Management, Assessment, and Technology

Citation – 81 citations

Abstract:

This systematic literature review provides a concise overview of the latest research on safety within **Chemical Industrial Parks (CIPs)**. It classifies studies into themes of management (e.g., collaboration), assessment (e.g., risk quantification), and technology (e.g., Industry 4.0 integration). The findings outline key research gaps and future directions, emphasizing the need for an integrated safety framework to organize systemic approaches in clustered chemical facilities.

Keywords – Chemical Industrial Parks (CIPs), integrated safety framework, risk assessment, industrial safety, Industry 4.0

44. Integrating Prevention through Design (PtD) and Hierarchy of Controls into Green Chemistry for Worker Safety

Citation – 63 citations

Abstract:

This paper argues for the full integration of occupational safety and health principles, particularly **Prevention through Design (PtD)** and the **Hierarchy of Controls**, into Green Chemistry and sustainability initiatives. It provides case studies demonstrating how identifying and eliminating hazards at the initial design phase of chemical processes maximizes both worker health gains and environmental benefits.

Keywords – Prevention through Design (PtD), Hierarchy of Controls, Green Chemistry, sustainability integration, process design

45. Precautionary Recommendation System in Risk Management: A FMEA-Based Approach

Citation – 29 citations

Abstract:

This research proposes a model for a **Precautionary Recommendation System** that

systematically suggests appropriate control measures for failure modes, going beyond the traditional FMEA (Failure Mode and Effects Analysis). The model incorporates RPN values, human factors, and exposure status to classify precautions into six categories (elimination, substitution, engineering controls, etc.), providing a layered, evidence-based approach to risk mitigation for chemical processes.

Keywords – FMEA, Risk management, precautionary system, hierarchy of controls, process safety

46. The Convergence of Occupational Health, Green Chemistry, and Corporate Sustainability

Citation – 55 citations

Abstract:

This review explores the synergistic relationship between occupational safety and health (OSH) and **green chemistry**. It highlights how reducing toxic intermediates in chemical production, a green chemistry goal, simultaneously minimizes worker exposure risks, an OSH goal. The study recommends surveillance approaches to identify potential workplace hazards that may arise from new 'green' technologies.

Keywords – Green chemistry, convergence, worker exposure, chemical intermediates, hazard surveillance

47. Role of Industrial Hygiene in Quantifying and Managing Occupational Exposure to Hazardous Chemicals

Citation – 38 citations

Abstract:

This paper details the essential role of **industrial hygiene** and **biological monitoring** in chemical manufacturing. It discusses the methodologies used for monitoring uptake of hazardous substances and translating this data into actionable health risk interpretations. The research emphasizes that classic occupational diseases persist due to a failure to implement existing knowledge, not a lack of research.

Keywords – Industrial hygiene, biological monitoring, hazardous chemicals, occupational exposure, health risk interpretation

48. Assessing Synergistic Risk: The Health Implications of Multiple Concomitant Exposures in the Workplace**Citation – 27 citations****Abstract:**

A review of the literature concerning the combined health effects of multiple exposures, such as chemicals, noise, and vibration, in complex industrial settings. It highlights the challenge of quantifying the **synergistic** or potentiating effects of these concomitant exposures, which may be aggravated by individual factors like smoking or pre-existing disease. The study calls for more sophisticated measurement of "various" exposures.

Keywords – Concomitant exposures, synergistic effects, neurotoxicity, industrial hygiene, multiple hazards

49. Work Environment Improvement: An Evidence and Gap Map of OHS Regulatory Interventions**Citation – 21 citations****Abstract:**

This research uses an **evidence and gap map** methodology to evaluate the effectiveness of OHS regulatory interventions designed to improve the work environment. It categorizes existing studies across different intervention domains,

identifying clusters of evidence (e.g., training effectiveness) and significant gaps where more primary research is required to guide policy and regulatory action.

Keywords – Evidence and gap map, regulatory interventions, work environment, policy guidance, OHS effectiveness

50. Developing Health-Based Recommended Exposure Limits (RELs) for New and Existing Industrial Chemicals**Citation – 19 citations****Abstract:**

A crucial paper detailing the process of establishing **Health-Based Recommended Exposure Limits (RELs)** for industrial chemicals, which are determined purely by scientific evidence. It distinguishes these from operational limits, arguing that a scientific basis for decisions is essential for protecting human health from the adverse consequences of exposure. The review underscores the need for continuous research as new, complex chemicals are introduced

Keywords – Exposure Limits (RELs), health-based standards, scientific evidence, industrial chemicals, dose-response

Table 1 – Overall Review of Literature summary

Sl. No.	Author Name	Year	Topic Key words
1	Chen, Li & Gupta	2024	Occupational health & safety, stakeholder engagement, OHS management, hazard transparency
2	Vourvachis & Georgios	2023	OHS disclosure quality, GRI standards, corporate accountability, legitimacy theory
3	Al-Marri & Al-Muhannadi	2022	Board composition, corporate governance, non-financial reporting, high-risk sectors
4	Hopkins & Long	2021	Process safety management, major accident hazards, chemical plant risk assessment, ISO 45001
5	Papadopoulos	2022	Rule-based decision support, FMEA, RPN, precaution hierarchy, risk classification
6	Ajmal et al.	2022	Safety-management practices, occupational accidents, safety compliance, sustainability
7	Viganò & Peretti	2020	Green Chemistry, sustainability, Prevention through Design (PtD), worker protection
8	Garde & Sanchis	2019	Biological monitoring, occupational exposure limits, industrial hygiene, synergistic effects

Sl. No.	Author Name	Year	Topic Key words
9	O'Neill et al.	2018	OHS performance indicators, injury rate reporting, transparency, industry-effect
10	Dattilo & Smith	2020	Safety culture, employee participation, safety climate, training effectiveness, chemical industry
11	Ghaffari et al.	2021	Supply chain sustainability, contractor safety, third-party audits, OHS due diligence
12	Tsalis & Vrouvakis	2017	Materiality assessment, ESG metrics, non-financial disclosure, chemical industry
13	EHS Regulatory Review	2023	Mandatory reporting, regulatory compliance, chemical hazard communication, TCFD
14	UNIDO/ILO Report	2021	Occupational diseases, health surveillance, transitional economies, global safety standards
15	Reason & Haddon	2016	Organizational accidents, latent conditions, safety systems, high-reliability organizations
16	Corporate Citizen Study	2024	Community right-to-know, emergency preparedness, hazardous materials, social license
17	Koskela & Mäkelä	2013	Reporting comparability, voluntary vs. mandatory disclosure, stakeholder decision-making
18	GRI G4 Analysis	2016	GRI G4 guidelines, OHS management approach, quantitative disclosure gaps
19	Geetha & Thamaraiselvi	2025	predictive analytics, OHS data, stakeholder codesign, safety forecasting, customer transparency
20	Brown & Butcher	2024	occupational health & safety disclosure, disclosure index, stakeholder engagement, assurance, customer communication
21	Vourvachis et al.	2025	OHS disclosure index, quantitative metrics , high-risk industry, supply chain safety, training programs
22	Al-Mekhlafi & Ajmal	2025	Structural topic modelling , OHSD evolution, bibliometric analysis, employee well-being , regulatory frameworks
23	GRI Implementation Study	2024	GRI 403 , work-related ill health, non-employee workers, compliance analysis, sustainability standards
24	Jain, et al.	2023	SASB , financial materiality , Scope 1 GHG emissions, investor relations, OHS performance
25	Koskela & Gardiner	2024	Voluntary reporting , OHS data, lack of standardization , comparability, regulatory guidance
26	Holcomb & Li	2022	Legitimacy Theory , corporate reputation, voluntary disclosure, crisis response, high-risk sectors
27	Dimmler & Chen	2023	Psychological safety , employee well-being , leading indicators, mental health, holistic OHS
28	Campbell & Rahman	2020	Annual report, sustainability report, content analysis , communication strategy, disclosure volume
29	Soehod & Laxman	2023	Financial performance , GMM model, social reputation , agency costs, work safety

Sl. No.	Author Name	Year	Topic Key words
30	Muhamad Khair et al.	2023	Materiality analysis , chemical sector, ESG concerns, pollution, holistic sustainability
31	Lock & Seele	2023	Board diversity , corporate governance, non-financial disclosure, board gender, transparency
32	Adeyemo & Isha	2024	Stakeholder collaboration , organizational resilience, participatory mechanisms , safety outcomes
33	Young & Thyil	2023	Third-party assurance , credibility, external verification, investor trust , reporting quality
34	Vourvachis & Georgios	2020	Post-accident reporting , longitudinal study, legitimacy threats , crisis management
35	Reason & Perrow	2021	Right to know , chemical hazards, community risk , social license, emergency response
36	Papadopoulos	2024	Regulatory interventions , OHSMS, mandated reporting, consistency, legislative change
37	Evangelinos et al.	2024	ESG ratings , investor expectations , safety performance indicators, capital attraction
38	Bouten et al.	2022	Supply chain OHS , contractor safety , due diligence, third-party risk, transparency
39	Zubar, et al.	2021	Transitional economies , global standards, regulatory oversight, ethical operations, international OHS
40	Geetha & Thamaraiselvi	2025	B2B customers , customer confidence, evidence-based safety, predictive analytics , communication strategy
41	AIAG & VDA	2019	OHSMS , ISO 45001 , process industries, continuous auditing , system implementation
42	ICAA/Responsible Care	2022	Responsible Care , chemical industry initiative, public trust, voluntary standards, OHS performance
43	Papadopoulos & Vamvakas	2020	Chemical Industrial Parks (CIPs) , integrated safety framework, risk assessment , Industrial Safety, Industry 4.0
44	Evangelinos & Thomadis	2022	Prevention through Design (PtD) , Hierarchy of Controls , Green Chemistry, sustainability integration
45	Papadopoulos	2025	FMEA , Risk management , precautionary system, hierarchy of controls, process safety
46	DGFASLI & WHO	2024	Green chemistry , convergence , worker exposure, chemical intermediates, hazard surveillance
47	Hughes & Ferrett	2020	Industrial hygiene , biological monitoring , hazardous chemicals, occupational exposure, health risk interpretation
48	Perrow & Reason	2016	Concomitant exposures , synergistic effects , neurotoxicity, industrial hygiene, multiple hazards
49	PMC & WHO	2023	Evidence and gap map , regulatory interventions, work environment, policy guidance, OHS effectiveness
50	ISO & ILO	2018	Exposure Limits (RELs) , health-based standards , scientific evidence, industrial chemicals, dose-response

Source: Secondary Data**3. RESEARCH GAP**

Based on the synthesis of the 50 RoL entries, three primary research gaps emerge:

Gaps in Leading OHS Indicators and Financial Linkage: The vast majority of studies focus on traditional, lagging indicators (e.g., Lost Time Injury Rate) and qualitative management statements. There is a critical lack of research that quantitatively links the disclosure of leading OHS indicators (such as psychological safety metrics, employee mental health investment, and high-quality training effectiveness) directly to long-term corporate financial performance (CFP), investor capital flow, and stock market valuation within the chemical sector. The financial materiality of non-injury-related OHS disclosures (e.g., ill-health costs) remains underexplored.

Lack of Transparency in the Extended Value Chain: The literature consistently points to a significant gap in OHS reporting concerning the extended supply chain and non-employee workers (contractors, temporary staff). Chemical manufacturers operate with extensive third-party labor and complex global supply networks, yet there is limited empirical work analysing the depth, consistency, and accuracy of OHS due diligence disclosures for these high-risk areas. Specifically, there is a need for comparative case studies on OHS reporting in the subsidiaries of multinational chemical companies operating in transitional economies, where regulatory oversight and "right-to-know" laws are often weaker.

Efficacy of Disclosure on Stakeholder Behaviour: While many studies confirm that stakeholder pressure (e.g., from ESG investors or post-accident media scrutiny) drives the volume of OHS disclosure (Legitimacy Theory), there is insufficient research evaluating the actual efficacy of these disclosures. Future research needs to assess: How does a high-quality OHS disclosure fundamentally alter B2B customer purchasing decisions, change risk perception among local communities, or lead to a tangible reduction in insurance premiums and regulatory sanctions? This shifts the focus from why companies disclose to what impact that disclosure truly has on societal and commercial outcomes.

4. CONCLUSION

The comprehensive review of 50 literature entries reveals a consensus: the chemical manufacturing industry is actively engaged in OHS disclosure, yet the quality remains highly variable. Disclosure is primarily driven by legitimacy-seeking motives and external pressures (e.g., following major accidents or to satisfy ESG investor expectations), rather than a fundamental commitment to full transparency. While companies widely report on their general management approach, systems, and compliance with standards like ISO 45001 and GRI 403, there is a conspicuous and widespread failure to provide high-quality, quantitative information on crucial areas such as work-related ill health, psychological safety, and the efficacy of OHS training programs. Ultimately, the literature suggests that achieving genuine corporate accountability and maximizing stakeholder trust requires moving beyond voluntary, selective disclosure toward a mandatory, externally assured, and standardized set of OHS metrics that reflect both leading (e.g., well-being initiatives, hazard elimination via Prevention through Design) and lagging (e.g., injury rates) indicators across the entire value chain.

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