

Industrial Disasters in India, Scale, Causes, Impact, Challenges

June 12, 2026 • vajiramandravi.com



Recent industrial accidents in India have once again raised concerns regarding workplace safety and industrial risk management. Four workers died while cleaning a septic tank in Surat after inhaling toxic gases, while nine workers were killed in an explosion at a steel plant in Visakhapatnam. These incidents highlight persistent shortcomings in occupational safety, enforcement mechanisms, and industrial risk management despite the availability of established safety protocol.

What are Industrial Disasters?

Industrial disasters are major **accidents arising from industrial activities** that result in loss of life, injuries, environmental damage, destruction of property, or disruption of economic activities.

They generally occur due to **technological failures, human errors, negligence, poor safety practices, equipment malfunction, hazardous material leaks, explosions, fires, or inadequate disaster preparedness.**

Scale of Industrial Disasters in India

- According to the **National Disaster Management Authority (NDMA)**, over 130 significant **chemical accidents** have been reported in the country in the last decade, claiming more than 250 lives.
- According to IndustriAll data, at least 240 workplace accidents were reported from manufacturing, mining, and energy sectors in a single recent year, causing over 400 fatalities and many more injuries
- India witnesses **over 4,000 industrial accidents annually**, as per Labour Bureau and NCRB data. Sectors such as chemicals, construction, mining, and manufacturing account for the majority of workplace fatalities.
- **Over the past two years alone, 125 accidents across six major industrial areas on the outskirts of Hyderabad** claimed 133 lives and left over 350 people seriously injured.
- The fireworks factories in Sivakasi — which manufactures about 90% of India's crackers — witnessed 236 accidents from 2014 to April 2025, resulting in the death of 291 people, with 204 others injured

Major Industrial Disasters in India

- **Bhopal Gas Tragedy (1984)**: Leakage of Methyl Isocyanate (MIC) gas from the Union Carbide plant in Bhopal caused thousands of deaths and remains the world's worst industrial disaster.
- **Visakhapatnam LG Polymer Gas Leak (2020)**: Leakage of styrene gas led to several deaths and affected nearby communities.
- **Chasnala Mining Disaster (1975)**: Flooding of a coal mine in Jharkhand resulted in the death of over 370 miners.
- **Jaipur IOC Depot Fire (2009)**: A massive fire at an oil depot caused loss of life and significant economic damage.
- **Surat Septic Tank Deaths (2026)**: Workers died due to toxic gas exposure while cleaning a confined space without adequate safety equipment.
- **Visakhapatnam Steel Plant Explosion (2026)**: An explosion involving molten steel led to multiple fatalities, highlighting process safety concerns.

Causes of Industrial Disasters in India

Industrial disasters are usually the result of multiple systemic failures rather than isolated accidents.

- **Weak Safety Culture**: Many industries prioritize production and profitability over worker safety, as seen in several factory explosions across industrial clusters.
- **Poor Regulatory Enforcement**: Weak inspections and inadequate compliance monitoring allow safety violations to continue unchecked despite existing laws.
- **Regulatory Fragmentation**: Overlapping responsibilities among labour departments, environmental authorities, and disaster management agencies create accountability gaps.
- **Ageing Infrastructure and Deferred Maintenance**: Use of outdated machinery and delayed maintenance increases accident risks, as alleged in the Visakhapatnam steel plant explosion (2026).
- **Violation of Safety Protocols**: Standard safety procedures are often ignored, particularly in confined-space operations such as septic tank cleaning deaths in Surat.

- **Lack of Safety Equipment:** Absence of fire alarms, heat sensors, and automatic shutdown systems contributed to the Sigachi Industries explosion (2025) in Telangana.
- **Inadequate Worker Training:** Workers handling hazardous substances frequently lack proper safety training and emergency response skills.
- **Contract Labour and Outsourcing:** Contract workers often receive less protection and training, making them more vulnerable to workplace accidents.
- **Corporate Negligence and Cost-Cutting:** Safety audits, equipment upgrades, and preventive measures are often compromised to reduce operational costs.
- **Illegal and Informal Industrial Operations:** The Deesa Firecracker Godown Blast (2025) in Gujarat highlighted the dangers of operating hazardous units with expired licences.
- **Unsafe Handling of Hazardous Materials:** Improper storage and handling of chemicals, explosives, and combustible materials frequently trigger fires and explosions.
- **Lack of Emergency Preparedness:** Absence of rescue teams, emergency plans, and disaster-response mechanisms increases casualties when accidents occur.

Impact of Industrial Disasters in India

Industrial disasters have significant human, economic, social, environmental, and governance consequences, often extending far beyond the immediate accident site.

- **Loss of Human Lives:** Industrial accidents claim hundreds of lives annually; the **Bhopal Gas Tragedy (1984)** alone caused over 15,000 deaths, while the Sigachi Industries explosion (2025) killed 46 workers.
- **Health and Occupational Hazards:** Survivors often suffer from chronic respiratory diseases, cancers, disabilities, and psychological trauma, as seen among victims of the Bhopal disaster even decades later.
- **Livelihood Insecurity:** Most victims belong to economically vulnerable groups, particularly migrant and contract workers, pushing affected families into poverty and indebtedness.
- **Economic Losses:** Industrial disasters result in loss of production, infrastructure damage, compensation liabilities, and disruption of supply chains, imposing substantial costs on industries and governments.
- **Reduced Investment and Business Confidence:** Frequent accidents can undermine investor confidence and affect India's ambition of becoming a global manufacturing hub under initiatives such as Make in India.
- **Environmental Degradation:** Chemical leaks, explosions, and industrial fires contaminate air, water, and soil, causing long-term ecological damage and loss of ecosystem services.
- **Threat to Public Health:** Toxic releases can affect entire communities; for example, the LG Polymers gas leak (2020) impacted more than 1,000 residents of nearby villages.
- **Burden on Public Resources:** Governments incur significant expenditure on rescue operations, medical treatment, rehabilitation, environmental remediation, and compensation.
- **Social Distress and Displacement:** Industrial accidents can displace communities, disrupt education and livelihoods, and create long-term social insecurity among affected populations.
- **Impact on Vulnerable Groups:** Migrant workers, contract labourers, sanitation workers, women, and children often bear a disproportionate share of industrial risks due to unsafe working conditions.
- **Damage to India's Development Goals:** Workplace accidents reduce labour productivity and hinder progress towards inclusive growth, decent work, and sustainable industrialization.

- **Erosion of Public Trust:** Repeated incidents despite existing regulations weaken confidence in industrial safety mechanisms, corporate governance, and regulatory institutions.

Existing Regulatory and Legal Framework for Industrial Safety in India

India has developed a comprehensive legal and institutional framework to prevent industrial accidents, ensure worker safety, and manage industrial disasters.

- **Factories Act, 1948:** It regulates the health, safety, and welfare of workers in factories and prescribes standards relating to working conditions, machinery safety, and hazardous processes.
- **Environment (Protection) Act, 1986:** Enacted after the **Bhopal Gas Tragedy**, it empowers the government to regulate hazardous industries and prevent environmental pollution.
- **Manufacture, Storage and Import of Hazardous Chemical (MSIHC) Rules, 1989:** These rules regulate the handling, storage, and transportation of hazardous chemicals and require industries to prepare on-site and off-site emergency plans.
- **Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996:** They provide for crisis management groups at the Central, State, District, and Local levels to respond to chemical accidents.
- **Public Liability Insurance Act, 1991:** It ensures immediate relief to victims of accidents involving hazardous substances through the principle of **'No-Fault Liability'** and mandates insurance coverage for hazardous industries.
- **Disaster Management Act, 2005:** It established the **National Disaster Management Authority (NDMA)**, which issues guidelines on chemical and industrial disaster management and promotes preparedness and mitigation measures.
- **National Disaster Management Authority (NDMA) Guidelines:** NDMA has developed specific guidelines for chemical disaster management, risk assessment, emergency planning, and capacity building.
- **Occupational Safety, Health and Working Conditions (OSH) Code, 2020:** It consolidates 13 labour laws and provides a comprehensive framework for workplace safety, health standards, risk assessment, training, and welfare measures.
- **Safety Committees under OSH Code:** The Code mandates bipartite safety committees in specified establishments to strengthen worker participation in safety management.
- **Risk Assessment and Emergency Planning:** The OSH Code promotes preventive safety measures such as hazard identification, emergency response plans, personal protective equipment (PPE), and regular health check-ups.
- **State Factory Inspectorates:** These agencies are responsible for inspecting factories and enforcing safety standards at the state level.

Despite a robust legal framework, weak enforcement, shortage of inspectors, delayed implementation of the OSH Code, and poor compliance continue to contribute to industrial accidents.

Way Forward

Preventing industrial disasters requires a comprehensive approach that combines institutional reforms, technological innovation, strict enforcement, and worker-centric safety governance.

- **Establish a National Industrial Safety Authority (NISA):** Create an independent statutory regulator, on the lines of the **Atomic Energy Regulatory Board (AERB)**, to ensure professional and autonomous oversight of industrial safety.
- **Strengthen Technology-Driven Monitoring:** High-risk Major Accident Hazard (MAH) units should deploy IoT-based sensors and real-time monitoring systems to track pressure, temperature, and gas levels and automatically flag abnormalities.
- **Develop a Coherent National Safety Framework:** Integrate the Factories Act, Environment Protection Act, OSH Code, and NDMA guidelines into a unified industrial safety architecture.
- **Create a Centralised Chemical Risk Database:** Establish a national database mapping hazardous industries, risk profiles, accident histories, and proximity to human settlements for better planning and emergency preparedness.
- **Accelerate Implementation of the OSH Code, 2020:** All states should promptly notify rules under the Code and strengthen inspection mechanisms through adequate staffing and technical expertise.
- **Increase Regulatory Capacity:** Expand the number of factory inspectors, safety auditors, and occupational health professionals to improve compliance monitoring.
- **Link Insurance to Safety Performance:** Corporate insurance premiums and other financial incentives should be linked to safety audit scores and compliance records.
- **Strengthen Corporate Accountability:** Impose stringent penalties and criminal liability for negligence resulting in loss of life, environmental damage, or major industrial accidents.
- **Enhance Worker Training and Safety Awareness:** Regular safety drills, certification programmes, and mandatory training should be conducted for all workers, including contract labour.
- **Protect Contract and Migrant Workers:** Ensure equal safety standards, social security coverage, and access to grievance redressal mechanisms for vulnerable workers.
- **Improve Emergency Preparedness and Response:** Industries should maintain well-equipped emergency response teams, evacuation plans, and disaster management protocols.
- **Align with International Best Practices:** Adopt safety standards and regulatory frameworks recommended by the **International Labour Organization (ILO)** and other global agencies to promote a preventive safety culture.

Source: <https://vajiramandravi.com/current-affairs/industrial-disasters-in-india/>

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