STM JOURNALS

International Journal of
Manufacturing and Production Engineering

ISSN: 3049-2009
Volume 4, Issue 1, 2026
January–June
DOI (Journal): 10.37591/IJMPE

https://journals.stmjournals.com/ijmpe

Review IJMPE

Disaster Management for the Production Process in Manufacturing Industries

Bhojraj N Kale[1,*], Prakash V Dhopte[2], Pravin T Petkar[2], Bhushan B Deshmukh[2], Safal A Shambharkar[2], Sanjay A Sajjanwar[2]

Abstract

In manufacturing and businesses in general, damages occurring during production must be recorded. Production is carried out continuously every day through various processes that make up the supply chain. This process is often ineffective and causes damage. These disasters cause economic damage and losses, sometimes even death. These damages may result from accident, negligence or incompetence. There are other things around. This article focuses on damage elements associated with the manufacturing process. These attributes include: disaster management (prevention and mitigation), disaster duration (before, during and after the disaster), disaster type (interaction accident, fire). This article describes collaboration between higher education and industry in disaster reduction to educate workers and businesses involved in production on the importance of environmental management. This is an area of research that no company should ignore in the production process. In addition to these aspects, the role of modern technology such as automation, real-time monitoring systems, and data analytics has become increasingly important in identifying and reducing potential risks in production environments. Implementing strict safety protocols, regular maintenance of machinery, and continuous training programs for employees can significantly minimize the occurrence of such damages. Furthermore, establishing effective communication channels within the organization ensures that any potential hazards are reported and addressed promptly. Sustainable practices and adherence to environmental regulations also contribute to reducing long-term risks and improving overall production efficiency. Therefore, integrating technological advancements with proper management strategies can enhance safety, reduce losses, and promote a more resilient manufacturing system.

Keywords: Disaster, economic loss, management, production process, supply chain inefficiency, workplace safety

***Author for Correspondence**
Bhojraj N Kale
E-mail: bhojrajkale@gmail.com

[1]Associate Professor, Department of Mechanical Engineering, Jhulelal Institute of Technology, Nagpur, Maharastra, India
[2]Assistant Professor, Department of Mechanical Engineering, Jhulelal Institute of Technology, Nagpur, Maharastra, India

Received Date: March 20, 2026
Accepted Date: March 21, 2026
Published Date: March 30, 2026

Citation: Bhojraj N Kale, Prakash V Dhopte, Pravin T Petkar, Bhushan B Deshmukh, Safal A Shambharkar, Sanjay A Sajjanwar. Disaster Management for the Production Process in Manufacturing Industries. International Journal of Manufacturing and Production Engineering. 2026; 4(1): 16–19p.

INTRODUCTION

From the perspective of social phenomena, disaster refers to a type of crisis with serious consequences [1, 2]. It may be a natural or man-made event that will cause serious and uncontrollable damage to the body or the entire area [3, 4].

The meanings of the words disaster and management are different from each other. However, they are united under the umbrella of disaster management. Generally speaking, disasters occur every day. Even now this place is in ruins. It happens wherever there is human activity. From the simple task of moving from one place to another to the most complex [5].

Disasters cause many dangers to the world every year. According to the United Nations Human Settlements Program (UNHSP), disaster events caused more than $24 billion in damage in the first half of 2001 alone. Meanwhile, 30 international conflicts affect more than 60 million people in the population. The World Bank estimates that the 1998 disaster resulted in the deaths of more than 50,000 people and the destruction of $65 billion worth of property and infrastructure. Approximately 95% of disaster deaths occur in developing countries, often with devastating consequences for the least fortunate. It can also create the impression that similar countries are repeating the negative effects of the disaster. For example, catastrophic events in Mexico between 1980 and 2000 killed 10,000 people a year and caused $6.5 billion in damage. It can also create the impression that the harm and its products are widespread. Estimates show that of the 100 greatest disasters of the twentieth century, 65 occurred in the 1990s, 25 in the 1980s, 10 in the 1970s, and fewer in the last decade [6].

Innovation in warfare, meanwhile, hopes to check such advocates. There is no doubt that when the business grows, with the extension of the extension line, the solutions become ineffective, as with the growth our water, electricity, gas, and communications also become increasingly expanded. and different assets, such as food. They also appear to have varying levels of trust in online systems and government agencies. Clear health and safety systems, such as workplace health, protest committees and police, are also important. Moreover, as the global economy grows, real solutions are interconnected and a disaster in one can lead to complete disruption in many countries. In fact, as the happy events of September 2001 showed, although these are images of national achievements and culture, those produced in particular can become the focus, with destruction everywhere [7].

Disaster Attributes

Space-based disasters have many characteristics. These attributes include variables, such as disaster management (prevention and mitigation), disaster duration (before, during, and after), disaster type (damage, fire). These are signs of the collapse of the economy. Disaster management involves preventing, mitigating or preventing disasters. The nature of destruction brings it together with control and management. This nature of disaster management outlines the principles that govern the business of disaster management. This includes disaster management and disaster prevention decisions [8].

Work time before and after a disaster is a product of the disaster. When a disaster occurs, many activities occur before and after the disaster. These activities increase the characteristics of the disaster. Disasters have become a part of daily life in many parts of the world. The problem concept of fiasco captures the essence of everyday life and has implications for social, human, financial, political, and ecological problems. The causes of fiascos may be different, and many of the risks are still interrelated [9].

General Approach

Disaster management is essential for the development of any business. The bigger the problem, the less chance the business has. Disasters will become more frequent and severe, damaging human creation and human conditions. All partners who may encounter a disaster have a responsibility to develop skills to prepare, mitigate, respond, and recover. While rescue operations and effective planning can reduce the dangers caused by various hazards, post-disaster response will reduce the impact of the disaster and the associated risks for economic and catastrophic damages that can often occur [10].

Educational Approach

This section summarizes current approaches to problem solving, challenges faced in disaster education, and recommendations and best practices for education. Report damage caused by the integration of deep learning. The main accreditations available for disaster management education are undergraduate/postgraduate courses run by HEIs; These final project(s) are prepared by undergraduate and graduate students; HEIs have been developed by professional bodies and various short-term schools; information is often available on the internet; other traditional forms, such as reading documents, newspapers, and different distributions; through understanding and learning [11].

Industry Approach

In the case of industry, specific standards are developed to guide disaster management. These measures regulate daily practices in the business. Paying attention to these aspects can help reduce damage-related problems. High performance is the goal of all architectural organizations and individuals, whether public or private, nationally or internationally [12]. Clearly, operational excellence in design management or any other field is important to many organizations and individuals. This great performance has been achieved thanks to the structure that directs the operations of the enterprise [13].

DISASTER CONTROL IN PRODUCTION

The impact of damage on production lines or processes cannot be overstated. Damage control is very important to improve the production process. The variety of manufacturing materials can lead to disaster if not treated properly. The reasons for managing the economy are gradually becoming more and more successful. It includes the following subareas: ongoing, compliance, and compliance measures. Similarly, machine malfunction can also cause damage. There are many factors that cause damage. It is possible to see the above-mentioned reaction to these disasters in various ways. We will look at an overview, focusing on industrial production [14].

Production Process (Process)

The industrial production process depends on certain principles. These are all adventures to complete a project. Failure to comply with the production line can result in damage, fire, equipment damage, machine-to-human contact to the site where people are connected to the machine, and actual damage. In the chemical industry, mixing the wrong synthetics can have disastrous results. Poor performance in the automotive industry can lead to accidents that endanger the safety of life and property. In the electrical power industry, if you are not careful during power generation, you will get electrocuted. Damage is related to economics [15].

PRODUCTION LINE DISASTER SCENARIO

Case Study

The T. A. Gillespie Company Shell Loading Plant Impact, collectively known as the Morgan Magazine Impact or like names, occurred on Friday, October 4, 1918 at 7:00 p.m. EST 36 begins at the World War II Cemetery in the Sayreville-Morgan area of Middlesex County, New Jersey, United States. The fire, which lasted three days and totaled approximately six thousand tons, killed approximately 100 people and injured hundreds more, started with a massive blow that was generally thought to be an accident. Damage to the plant required large capital costs, and the U.S. government paid undisclosed amounts of money to residents, according to the investigation. According to one report, enough ammunition was used in the conflict to last the West half a year, and it is estimated that there was many explosives. Construction of the power plant started three months ago and the war ended a month after the intervention. Although there were multiple explosions over three days, the entire incident was one of the worst impacts of non-nuclear men in history. What is undeniable is that 20 kilometers away from the action, the most important person was hit by explosives or car bullets, his windows were broken.

CONCLUSION

Obviously, economic development in developing countries should be given some limits and the ability to predict natural and man-made disasters. Activities should be carried out both at home and abroad. Most of the time, significant mediation is simple and requires little financial precaution and protection. It is important to strengthen understanding of the connection between mass gathering, mass building, mass development and problem solving. The best place to start is with schools, as well as designing appropriate training and delivery for professionals. This would be a good starting point to learn about disaster management and subsequently many other manufacturing industries.

REFERENCES

1. Tierney, K.J. 2007. Businesses and disasters: Vulnerability, impacts, and recovery. In Handbook of disaster research, ed. H. Rodr ´ıguez, E.L. Quarantelli, R.R. Dynes, and K.J. Tierney, 275–296. New York: Springer.

2. Zhang, Q., Lu, Q., Zhong, D., & Ye, X. (2018). The pattern of policy change on disaster management in China: A bibliometric analysis of policy documents, 1949– 2016. International Journal of Disaster Risk Science, 9(1), 55-73.
3. Dwivedi, Y. K., Shareef, M. A., Mukerji, B., Rana, N. P., & Kapoor, K. K. (2018). Involvement in emergency supply chain for disaster management: a cognitive dissonance perspective. International Journal of Production Research, 56(21), 6758-6773.
4. Whybark, D. C., S. A. Melnyk, J. Day, and E. Davis. 2010. "Disaster Relief Supply Chain management: New Realities, Management Challenges, Emerging Opportunities."Decision Line 41 (3): 4–7.
5. Balcik, B., and B. M. Beamon. 2008. "Facility Location in Humanitarian Relief."International Journal of Logistics: Research and Applications 11 (2): 101–121.
6. Adegite,S.A; Ilori, M.O; Ire fin, I.A;Abereijo, I.O; Adermi, H. O. . (2007). Evaluation of the Impact of Entrepreneurial Characteristics on the Performance of Small Scale. Journalof Asia Entrepreneurship and Sustainability, III (1), 1–22.
7. Chaudhari, P., & Charholi, L. V. (2018). Productivity in Manufacturing Industries Using Knowledge Management, (June).
8. Henao, R., Sarache, W., & Gomez, I. (2017). Social Performance Metrics for Manufacturing Industry. 24th Eur OMA Conference, (July), 10.
9. Silaipillayarputhur, K. (2018). Process safety management in manufacturing industries a review, (January). https://doi.org/10.14419/ijet.v7i2.9252
10. Siriwardena, N. U., Haigh, R. P., & Environment, H. (n.d.). Disaster! In Search of a Definition: Specific To Construction Industry, 249–259.
11. Thayaparan, M., Malalgoda, C., & Keraminiyage, K. (2014). Disaster Management Education through Higher Education – Industry Collaboration in the Built Environment. Procedia Economics and Finance, 18 (September), 651–658.https://doi.org/10.1016/S2212-5671(14)00987-3
12. Singh, B. N. (2018). Role of Automation in Steel Industry, (May).
13. Olayinka, O. S., & Abdullahi, S. A. (2009). An Overview of Industrial Employees' Exposure to Noise in Sundry Processing and Manufacturing Industries in Ilorin Metropolis, Nigeria. Industrial Health, 47(2), 123–133. https://doi.org/10.2486/indhealth.47.123
14. Gupta, A. K., & Nair, S. S. (2016). Chemical (Industrial) Disaster Management, (November).
15. Kamolsook, A., Badir, Y. F., & Frank, B. (2019). Technological Forecasting & Social Change Consumers ' switching to disruptive technology products: The roles of comparative economic value and technology type. Technological Forecasting & Social Change, (May 2017), 0–1. https://doi.org/10.1016/j.techfore.2018.12.023

