

## Chapter 6

# IoT Devices for Natural Disasters: IoT Technologies for Natural Disaster Management

**A. Gobinath**

*Velammal College of Engineering and Technology, India*

**Manjula Devi**

*Velammal College of Engineering and Technology, India*

**P. Rajeswari**

*Velammal College of Engineering and Technology, India*

**A. Srinivasan**

*Velammal College of Engineering and Technology, India*

### **ABSTRACT**

*In recent years, the convergence of internet of things (IoT) technologies has emerged as a pivotal force in revolutionizing the landscape of natural disaster management. This chapter explores the diverse array of IoT devices designed to monitor, detect, and respond to various natural disasters, providing a comprehensive overview of their applications and impact on disaster resilience. The chapter delves into the role of weather stations equipped with advanced sensors, capable of collecting real-time meteorological data such as temperature, humidity, wind speed, and atmospheric pressure. These stations contribute significantly to early detection and improved forecasting of weather anomalies, offering a crucial advantage in disaster preparedness.*

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## **1. INTRODUCTION**

Over the past few decades, the world has witnessed a concerning surge in the frequency and severity of natural disasters, presenting unprecedented challenges to communities, governments, and global initiatives aimed at sustainable development. Climate change, driven by human activities such as deforestation, industrial emissions, and the burning of fossil fuels, has intensified the occurrence and impact of natural disasters. Rising global temperatures contribute to the intensification of hurricanes, typhoons, and cyclones, leading to more destructive storms with increased rainfall and higher wind speeds. Additionally, the warming of the Earth's surface contributes to the melting of glaciers and polar ice caps, resulting in rising sea levels that heighten the risk of coastal flooding and storm surges (Jayaraman, 2016). These climatic shifts have amplified the frequency of extreme weather events, including heatwaves, droughts, wildfires, and heavy precipitation, creating a complex and interconnected web of natural disasters that affect diverse regions across the globe (Kaloxylos, 2017).

The implications of this trend extend beyond environmental concerns, permeating into social, economic, and geopolitical realms. Populated coastal areas face elevated risks of inundation due to sea-level rise, displacing communities and challenging existing infrastructure. Extreme weather events contribute to food and water scarcity, exacerbating poverty and triggering mass migrations. The economic toll of natural disasters is staggering, with billions of dollars in damages annually and a disproportionate impact on low-income countries that often lack the resources to swiftly recover. The increasing severity of natural disasters demands a multi-faceted approach that combines mitigation, adaptation, and technological innovation to enhance preparedness and response efforts. As the global community grapples with the ongoing ramifications of climate change, there is an urgent need to develop and implement robust strategies that leverage technology, including Internet of Things (IoT) devices, to mitigate the impact of natural disasters and build resilient societies capable of withstanding these escalating challenges (Manneback et.al, 2020).

In the face of the escalating frequency and severity of natural disasters, the imperative for innovative solutions has never been more pronounced. Traditional approaches to disaster management are proving inadequate in addressing the dynamic and complex nature of these events, necessitating a paradigm shift towards cutting-edge technologies and forward-thinking strategies. The crux of the matter lies in the holistic enhancement of preparedness, response, and recovery efforts, where innovation becomes the linchpin for building resilient communities (Moessner, 2015).

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