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# AI Powered Disaster Management System

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**Abstract:- Disasters or hazards have the potential to cause catastrophic damage and significant socioeconomic loss. The year 2022 has been recorded as the eighth consecutive year with 10 or more billion-dollar weather or climate related disasters. As a result, an AI powered Disaster Management system is developed. It aims to strengthen disaster mitigation strategies using AI technology. It helps in detecting and preparing for the extreme weather and other hazards, and also to communicate to people and communities effectively about the necessary response. AI helps response teams to understand the hazards or accidents, monitor events in real time and anticipate specific pitfalls in the face of impending or on-going disasters. The disasters can either be predicted with the help of AI technology by training machine learning models or be detected from live news feeds. AI is used during different phases of disaster operation first, vaticination and protuberance; also, to help communicate what has passed; and in the monitoring and early discovery of implicit new pitfalls.**

## I. INTRODUCTION

Natural disasters are situations that no one can control. Natural disasters kill thousands of people every year and cause billions of dollars in economic losses. No country or community is immune. In recent years, the number of natural disasters has increased, and along with that, the damage caused by urbanization and population growth has increased, and the impact of natural disasters has come to be felt more strongly. Of all the continents, Asia is considered the most disaster-prone. Between 1991 and 2000, Asia accounted for 83% of the world's population affected by disasters. India is very prone to natural disasters and the country regularly experiences very severe natural disasters. In the case of India, among the different types of natural disasters that affect different parts of the country, floods, hurricanes, earthquakes and droughts cause the greatest damage to life and property. Heat waves, cold snaps, avalanches, landslides and fires regularly cause great damage to life and property. Floods are an annual event in India and disaster management has changed little from year to year. Nearly 15% of India is at risk of flooding. The Times of India reports that 2,000 lives are lost each year, 80,000 hectares of farmland are damaged, and costs around Rs 180 crore.

The system is actually an AI powered disaster management service, that is through the internet. This is a method of providing services to affected victims in the situation of a disaster. It is the procedure to predict any possible disaster and provide quick responses to the public. It aims to strengthen disaster mitigation strategies using AI technology. It helps in detecting and preparing for the extreme weather and other hazards, and also to communicate to people and communities effectively about the necessary response. AI helps response teams to understand the hazards or accidents, monitor events in real time and anticipate specific risks in the face of impending or on-going disasters.

## II. LITERATURE SURVEY

The paper [1] proposes an IoT-based flood monitoring and artificial neural network(ANN) based flood forecasting designed to increase scalability and reliability of flood control systems. The main objective of this system is to monitor humidity, temperature, pressure, precipitation, river water level and find their temporal correlation information for floods predictive analysis. The IoT approach is deployed to collect data from sensors and Wi-Fi communication and ANN approach is used for data analysis in flood prediction.

The paper [2] is focused on the development of an effective flood prediction system using machine learning (ML) algorithms that can help prevent loss of human life and property. The paper use k-nearest neighbors (KNN), support vector machines (SVM), random forests (RF) and decision trees (DT) to build ML models. And to solve the problem of oversampling and low accuracy, a stacking

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classifier will be used. The paper uses precision, f1-score, recall and precision to compare between these models. The results suggest that layered models are best for forecasting floods due to real-time rainfall in a given area.

Paper [3] proposes a fully functional and efficient earthquake detector cum forecaster based on deep neural networks of long-short-term memory (LSTM) units. The model captures inherent temporal characteristics of earthquake data.the proposed LSTM model shows satisfactory performance for small to medium-sized earthquakes and also implements a baseline artificial neural network (ANN) model to perform a suitable comparison.

The paper[4] proposed six different machine learning classifiers namely Artificial Neural Network, Random Tree, CHAID, Discriminant, XGBoost Tree, and Tree-AS on six datasets of different regions of India. All the algorithms have been applied to each dataset. The objective of this paper is to predict the value of magnitude for the future earthquake in India and nearby regions from the historical data on earthquakes. From the result, It has been observed that for Andaman & Nikobar dataset XGBoost Tree achieved the highest accuracy with 99.10%, for the Gujarat dataset Tree-AS achieved the highest accuracy with 91.67%, for the North India dataset Artificial Neural Network achieved the highest accuracy with 99.13%, for North East India dataset XGBoost Tree achieved the highest accuracy with 99.04%, for Nepal-UP-Bihar dataset XGBoost Tree achieved the highest accuracy with 99.01%, for Nearby India's Country dataset XGBoost Tree achieved the highest accuracy with 92.12%. From all the results, it has been noted that the XGBoost tree classifier performed well in most datasets., the Curve has been made between magnitude & gap, magnitude & magnitude error, and magnitude and depth error for finding the mathematical relation between them.

## III. EXISTING SYSTEMS

In the existing system, in India, the main goal of disaster management is to mitigate or avoid damages that may be caused by hazards and disasters. It also ensures that prompt, appropriate and prompt action can be taken for effective recovery. The National Disaster Management Agency (NDMA) is currently the supreme agency responsible for disaster management in India. The NDMA is chaired by the Prime Minister of India. The Disaster Management Act 2005 defines disaster management as the integrated process of planning, organizing, coordinating and implementing actions to effectively manage disasters. In India, government agencies lack proper disaster management training and are ill-equipped to deal with natural disasters through effective mitigation and preparedness measures. Disasters and their management are commonly discussed in terms of their consequences, but in practice this should lead to the planning and preparation of strategies to deal with and mitigate disasters in a responsible and effective manner.

## IV. PROPOSED SYSTEM

In the proposed system, we introduce an efficient system to manage disasters with minimum manual work. In the proposed system, it uses the technology of AI to enhance the working of the existing processes of disaster management. Phases like: mitigation, preparedness, response and recovery are processes that are improved by the AI technology. Our proposed system helps enhance disaster mitigation strategies using AI technology. Helps you recognize and prepare for extreme weather and other hazards. Send notifications of nearby disasters, effectively informing people and communities about required actions. The AI techniques used to support disaster management in all phases consist of several ML and DL methods. The main disasters to be considered for this project are earthquakes and floods. With the help of an artificial neural network, the datasets are trained and modelled for it to predict the happening of the disaster. Flood prediction uses K-Means and earthquake prediction uses LSTM. LSTM stands for "Long Short-Term Memory"

The proposed system also uses live news feeds and social media analytics to send disaster notifications. AI can evaluate and authenticate photos and comments on Twitter, Instagram, and YouTube in real time to distinguish between true and false information. These key statistics help field responders get to problem locations faster and focus their efforts on the most vulnerable. This 4 information also helps reduce the time it takes rescue teams to find victims. Additionally, artificial intelligence (AI) and predictive analytics tools can scan digital information from Twitter, Facebook, and YouTube to provide early warning, ground-level location, and real time incident verification .

## V. CONCLUSION

The Project: An AI powered disaster management system aims towards providing a system which can provide responses quickly. Disaster management manages disasters over time. The four phases of disaster management: mitigation, preparedness, response and recovery are widely accepted. The AI techniques used to support disaster management in all phases consist of several ML and DL methods. ML methods like K-Means clustering algorithms and DL methods like Long Short-Term Memory (LSTM). ML and DL have enabled the development of systems capable of predicting, responding to, and recovering from disasters using large and complex data sets, resulting in practical decision support tools. These ways work the capability to manipulate different types of data from multiple sources and determine patterns that can give information that can not else be bared.

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