

CHAPTER 1

INTRODUCTION

Flood prediction is the use of forecasted precipitation and stream-flow data in rainfall-runoff and stream-flow routing models to forecast flow rates and water levels for periods ranging from a few hours to days ahead, depending on the size of the watershed or river basin. Flood prediction can also make use of forecasts of precipitation in an attempt to extend the lead-time available. Flood prediction is an important component of flood warning, where the distinction between the two is that the outcome of flood prediction is a set of forecast time-profiles of channel flows or river levels at various locations, while "flood warning" is the task of making use of these forecasts to tell decisions on warnings of floods.

Real-time flood prediction at regional area can be done within seconds by using the technology of artificial neural network. Effective real-time flood prediction models could be useful for early warning and disaster prevention.

1.1 Problem Statement

Among the natural disasters, floods are the most destructive, causing massive damage to human life, infrastructure, agriculture, and the socioeconomic system. Governments, therefore, are under pressure to develop reliable and accurate maps of flood risk areas and further plan for sustainable flood risk management focusing on prevention, protection, and preparedness.

1.2 Existing System

Physically based models were long used to predict hydrological events, such as storm, rainfall/runoff, shallow water condition, hydraulic models of flow, and further global circulation phenomena, including the coupled effects of atmosphere, ocean, and floods. Although physical models showed great capabilities for predicting a diverse range of flooding scenarios, they often require various types of hydro-geomorphological monitoring datasets, requiring intensive computation, which prohibits short-term prediction. Numerous studies suggest that there is a gap in short-term prediction capability of physical models. For instance, on many occasions, such models failed to predict properly.

1.3 Proposed System

This system aims to collect data from all the states of India and form a generalized dataset. A machine learning algorithm is applied to the labelled dataset, and patterns are extracted, which, in turn, obtain maximum accuracy with real-time input. In general, the dataset collected for predicting is split into a Training set and Test set. Generally, 7:3 ratios are applied to split the Training set and Test set. The Data Model is then created using a Multi-Layer Perceptron Classifier, and the resulting data set is then passed through it for prediction.

1.4 Objective

The objective of Flood Prediction using AI is to design a incremental model to predict floods based on rainfall levels, channel flows, river levels etc. An approach of prediction is using Artificial Neural Networks that has very good working efficiency produces the accurate results. The system helps to improve the performance. This method can be used to predict both long term and short term floods in a given region. Maintaining the project is easy and manageable.