**LITERATURE SURVEY**

**ESTIMATE THE CROP YIELD USING DATA ANALYTICS**

Deep learning has emerged as a potential tool for crop yield prediction, allowing the

model to automatically extract features and learn from the datasets. Meanwhile, smart farming

technology enables the farmers to achieve maximum crop yield by extracting essential parameters of

crop growth. This systematic literature review highlights the existing research gaps in a particular

area of deep learning methodologies and guides us in analyzing the impact of vegetation indices and

environmental factors on crop yield. To achieve the aims of this study, prior studies from 2012 to 2022

from various databases are collected and analyzed. The study focuses on the advantages of using

deep learning in crop yield prediction, the suitable remote sensing technology based on the data

acquisition requirements, and the various features that influence crop yield prediction. This study

finds that Long Short-Term Memory (LSTM) and Convolutional Neural Networks (CNN) are the

most widely used deep learning approaches for crop yield prediction. The commonly used remote

sensing technology is satellite remote sensing technology—in particular, the use of the Moderate-

Resolution Imaging Spectroradiometer (MODIS). Findings show that vegetation indices are the most

used feature for crop yield prediction. However, it is also observed that the most used features in the

literature do not always work for all the approaches. The main challenges of using deep learning

approaches and remote sensing for crop yield prediction are how to improve the working model for

better accuracy, the practical implication of the model for providing accurate information.

All the studies were carried out on different types

of crops, geological positions, and various features. Overall, the performance and accuracy

of the deep learning approach for crop yield prediction are better when compared to tradi-

tional machine learning approaches. The deep learning approaches are all equally capable

in crop yield prediction based on the factors/parameters used in the model. However, the

most effective deep learning approaches for crop yield prediction are the CNN- and LSTM-

based approaches. CNN has the ability to find important features that can influence the

crop yield prediction. Moreover, LSTM does not only identify the data’s variation pattern,

but also the time-series data’s dependent connection . Based on this study, it is observed

that the vegetation indices and the meteorological data are the most used features, where

the vegetation indices explain the crops’ characteristics and the meteorological data help to

monitor the climatic conditions, which has a direct influence on crop yield prediction. It

can also be seen that the factors influencing crop yield prediction.

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