1) Crop Yield Prediction Using Deep Reinforcement Learning Model for Sustainable Agrarian Applications:

Predicting crop yield based on the environmental, soil, water and crop parameters has been a potential research topic. Deep-learning-based models are broadly used to extract significant crop features for prediction. Though these methods could resolve the yield prediction problem there exist the following inadequacies: Unable to create a direct non-linear or linear mapping between the raw data and crop yield values; and the performance of those models highly relies on the quality of the extracted features. Deep reinforcement learning provides direction and motivation for the aforementioned shortcomings. Combining the intelligence of reinforcement learning and deep learning, deep reinforcement learning builds a complete crop yield prediction framework that can map the raw data to the crop prediction values. The proposed work constructs a Deep Recurrent Q-Network model, a Recurrent Neural Network deep learning algorithm over the QLearning reinforcement learning algorithm to forecast the crop yield. The sequentially stacked layers of the Recurrent Neural network are fed by the data parameters. The Q- learning network constructs a crop yield prediction environment based on the input parameters. A linear layer maps the Recurrent Neural Network output values to the Q-values. The reinforcement learning agent incorporates a combination of parametric features with the threshold that assist in predicting crop yield. Finally, the agent receives an aggregate score for the actions performed by minimizing the error and maximizing the forecast accuracy. The proposed

model efficiently predicts the crop yield outperforming existing models by preserving the original data distribution with an accuracy of 93.7%

2) Crop yield forecasting using data mining:

India is heavily reliant on agriculture. Organic, economic, and seasonal factors all influence agricultural yield. Estimating agricultural production is a difficult task for our country, particularly given the current population situation. Crop production assumptions made far in advance can help farmers make the necessary planning for things like storing and marketing. Crop production prediction involves a huge amount of data, making it a perfect candidate for data mining methods. Data mining is a method of accumulating previously unseen anticipated information from a vast database. Data mining assists in the analysis of future patterns and character, enabling companies to make informed decisions. For a specific region, this research provides a fast inspection of agricultural yield forecast using the Random Forest approach. The process of analysing, cleaning, and modelling data to generate useful knowledge and conclusions is known as data analysis. Methods are used to convert the customer's raw data into valuable information. This research can be extended to agriculture as well. Most farmers relied on their long-term field experience with specific crops to forecast a greater yield in the coming season. Nonetheless, they do not receive a fair price for their crops. It typically occurs because of insufficient irrigation or poor crop selection, but it may also occur when crop yields are lower than expected. Due to a variety of factors, the farmers who make up the majority do not achieve the predicted Crop yield. That data set of crop yield consists of many components. By studying the soil and atmosphere for the specific

area, which increase crop production, an optimal crop can be estimated. The advantage of this research mainly is Farmers will benefit from this forecast. To determine which crops are best for their farm based on soil type, ph., and fertilizer. In this paper, an effort is made to know the region-specific crop yield analysis and it is processed by implementing by random forest algorithm. In this project have chosen a dataset which in .csv format. For the training purpose, 80% of the data is used and the remaining 20% of data is used for testing. After successful training and testing, the next step is finding the accuracy of the model. We have achieved good accuracy which means this model is good for predicting yield. We have designed the Website which consists of Four Functional Modules as shown in the 1) Crop Module: This module will provide the list of available crops. On selection of each one of it will give a detailed description of the crop. 2) Soil Module: This module will provide the list of available soils. On selection of each one of it will give a detailed description of the soil. 3) Weather Module: In this module, by entering the city name the user can get the live weather forecast. Open weather app is free open-source weather data. Using a weather API key can fetch the current or historical weather data.

4) Data analytics platforms for agricultural systems: A systematic literature review

With the rapid developments in ICT, the current agriculture businesses have become increasingly data-driven and are supported by advanced data analytics

techniques. In this context, several studies have investigated the adopted data analytics platforms in the agricultural sector. However, the main characteristics and overall findings on these platforms are scattered over the various studies, and to the best of our knowledge, there has been no attempt yet to systematically synthesize the features and obstacles of the adopted data analytics platforms. This article presents the results of an in-depth systematic literature review (SLR) that have explicitly focused on the domains of the platforms, the stakeholders, the objectives, the adopted technologies, the data properties and the obstacles. According to the year-wise analysis, it is found that no relevant primary study between 2010 and 2013 was found. This implies that the research of data analytics in agricultural sectors is a popular topic in recent years, so the results from before 2010 are likely less relevant. In total, 535 papers published from 2010 to 2020 were retrieved using both automatic and manual search strategies, among which 45 journal articles were selected for further analysis. From these primary studies, 33 features and 34 different obstacles were identified. The identified features and obstacles help characterize the different data analytics platforms and pave the way for further research

3) A Novel Approach using Big Data Analytics to Improve the Crop Yield in Precision Agriculture

Agriculture is the main work field in India. The farming industry adopts less innovative technology compared to other industries. Information and Communication Technologies provide simple and cost-effective techniques for farmers to enable precision agriculture. The work proposes a state-of-the-art model in the agriculture field which will guide rural farmers to use Information and Communication Technologies (ICT) in agriculture fields. Big data analytics is

used to improve crop yield. It can be customized for precision agriculture to improve the quality of crops which improves the overall production rate. METHODOLOGY: The process of using technology in farming requires deep knowledge of agricultural practices, biology, and chemistry. Many parameters have to be taken into consideration and investigated in depth when designing a system that should improve cultivation procedures by making the whole process more effective. IoT can be used for precision agriculture in real-time. This architecture is divided into two modules: Data Collection Module and Data Processing Module. Data Collection Module: The Internet of Things is useful in managing the environment from a remote location. The sensor nodes used in the sensor networks can sense field parameters like moisture level in the soil, temperature, and pH level. Different types of sensors like temperature sensors, Humidity sensors and soil moisture sensors are used to collect real-time environmental data. Historical data about temperature and rainfall statistics are collected from standard data sets. Data collected from the farmers are integrated with this data. Data Processing Module: Since sensor network data is in unstructured data format Hadoop is a suitable platform to process unstructured data. Agriculture data contains a large amount of historical data which has to be combined with sensor network data so it is possible to expect a large volume of data for which Hadoop provides high scalability. The Hadoop network has two major parts Hadoop Distributed File System and the MapReduce programming paradigm. Advantage and Disadvantage: No methodology can be considered better than the others. Every company has to carefully evaluate its goals. Then, after careful analysis, you will be able to pick and use the best method to reach your goal.