ARTIFICIAL INTELLIGENCE IN AGRICULTURE

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Abstract- *In this paper presentation we show that data analysis using artificial neural networks (ANNs) has been increasingly applied worldwide in a range of scientific fields, including agricultural research. Based on ANN, the analysis of results can be obtained in a relatively short time, even when considering a lots of data. The method has become an attractive, alternate to accepted statistical methods, and provides mean results. Precision farming is based on ANN which is , relatively a new field of study whose goal is to improve cropping efficiency by variable application of crop treatments such as fertilizers , pesticides etc…..*

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I. NEEDS OF ARTIFICIAL INTELLIGENCE IN AGRICULTURE

Farming is the main occupation of India. About 70% of primary and secondary business is basedon farming and it is also the backbone of our Indian economy. Agriculture in India have the demand of production by 70% in order to suit the India's demand in next 50 years . Agriculture is endangered by limitation of resources,Climatic change, short term problems and regional problems. The solution for these problem in future is artificial intelligent, to match the requirement of the human being for the next 50 years. The human and Artificial Intelligence combines to reach the new phase of evolution in agriculture. This Artificial Neural Network study, outlines the adoption and the development of Artificial agent in agriculture, focusing on expert system, collection of data using sensors and transferring data to the machines ,developed for agriculture in an try to show their potential in the fields. Neural Networks set a stepping stone for Artificial Intelligence in Agriculture.

Indian population is expected to reach double of the current population 133.92 crores (as per Indian census 2017) in next 50 years. Which demand a growth of agricultural products by 70% to suit the population. This need for agricultural products cannot be satisfied by occupying the available unused 10% percentage of land. Which lead to intense cultivation of rest 90% of land(18,91,761 kmsq of cultivation land in India). This statistics is based on the Food And Agriculture Organisation (FAO) of United Nations . These requirements of agricultural productsneeds the system of artificial neural network to become a new technology, which gives a solution to the complex problems inagriculture. Though there are many type of Artificial Neural Network , this agricultural neural network is commonly used.

APPLICATIONS OF AI IN AGRICULTURE:

1. **1.The basic principal of ANN architecture and application of ANN is to find the crop yield by using various types of crops performance factors as the input parameter.** Artificial Neural Network is used to predict the suitable crops for particular soil and also suggesting proper fertilizer for soil.

2. Researchers have developed an artificial intelligence (AI) capable of **identifying diseases in plants**; specifically, the cassava plant, which is the most widely grown root on the planet and a decent source of carbohydrates.

3. Agriculture is slowly becoming digital and AI in agriculture is emerging in three major categories,
   1. agricultural robotics,
   2. soil and crop monitoring, and
   3. predictive analytics.

   1. Agricultural Robots – Companies are developing and programming autonomous robots to handle essential agricultural tasks such as harvesting crops at a higher volume and faster pace than human laborers.

   2.Crop and Soil Monitoring – Companies are leveraging computer vision and deep-learning algorithms to process

data captured by drones and/or software-based technology to monitor crop and soil health.

3. Predictive Analytics – Machine learning models are being developed to track and predict various environmental impacts on crop yield such as weather changes.

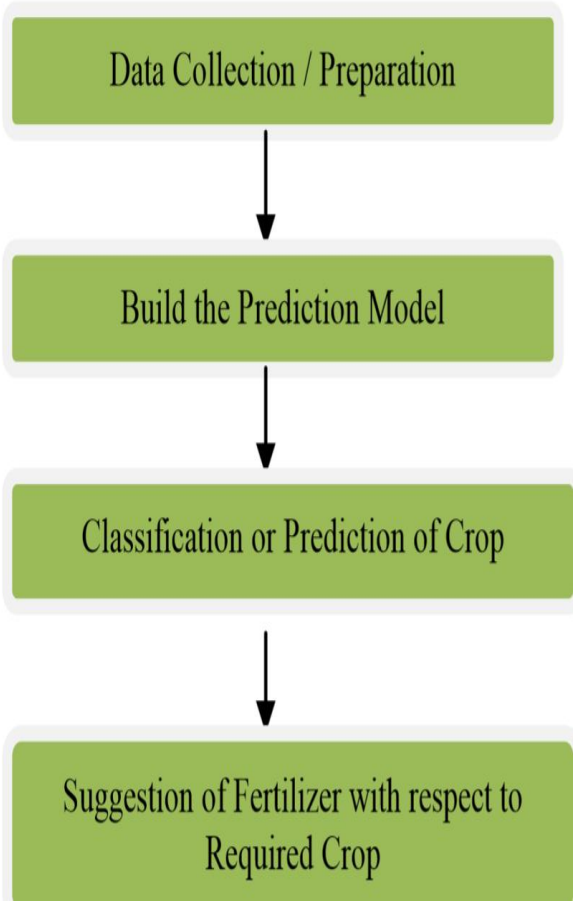
Farmers are increasingly using sensors and soil sampling to gather data and this data is stored on farm management systems that allows for better processing and analysis. The availability of this data and other related data is paving a way to deploy AI in agriculture

II. ANN – ARTIFICIAL NEURAL NETWORK.

It is a flexible mathematical structure which is capable of finding complex non – linear relationship between input and output data sets. Artificial Neural Network model have been found useful in problem for which the characteristic of process is difficulty to describe using physical equations it is used in agriculture.

NEED OF CROP PREDICTION USING ANN

Prediction of crop yield mainly strategic plants such as wheat, corn, rice has always been an interesting research area to agro meteorologists, as it is important in national a programming. Dry farming crop production, apart from relationship to the genetic of cultivator, adaphic terms, effect of pests and pathology and weeds, the management and control quality during the growing season and etc. is severely depend to climatic events. Therefore it is not beyond the possibility to acquire relations or systems which can predict the more accuracy using meteorological data. Nowadays, there are a lot of yield prediction models, that more of them have been generally classified in two group a) Statistical Models, b) Crop Simulation Model



Plant diseases diagnosis app - Plantix

The Berlin-based agricultural tech startup beta developed the Plantix app that identifies potential defects and nutrient deficiencies in soil.

The app uses images to detect plant diseases, a smart phone collects image which is matched with a server image and then a diagnosis of the plant health is provided. In this way the application uses AI and machine learning to solve the plant diseases.

Satellites for Weather Prediction and Crop Sustainability

Some of the Colorado based company uses machine learning algorithms in connection with satellites to predict weather, analyse crop sustainability and evaluate farms for the presence of diseases and pests.

For example, daily weather predictions, are customized based on the needs of each client and range from hyperlocal to global. Types of clients mentioned on the company's website include farmers, crop consultants and researchers.

THE DISADVANTAGES OF AI IN AGRICULTURE

1. Expensive
2. Difficulty in design of software development - slow and expensive
3. Dependency with the hardware
4. Few experienced programmers
5. Few practical products have reached the market as yet

FUTURE OF AI IN AGRICULTURE:

The future of farming depends largely on adoption of cognitive solutions. While large scale research is still in progress an some applications are already available in the market, the industry is still highly underserved. When it comes to handling realistic challenges faced by farmers and using autonomous decision making and predictive solutions to solve them, farming is still at anascent stage.

III. CONCLUSION

In this way we concluded that ANN is beneficial tool for crop prediction. Despite all the above mentioned opportunities, the applications of AI in the field of agriculture is still very limited ,but it is highly expected that AI will become one of the major research tool in the agricultural field. The reason behind this is huge demand to understand and predict the behaviour of any base on different physiological process. Although these applications of Ai in agriculture have some major disadvantage there is also a need in these applications to match the current situation and the requirement for the future these Ai technologies should be implement. These Ai technologies should be implemented everywhere in the country so that we can fulfil our needs .These Ai technology should be implemented in every villages of our country as they are the backbone of our nation. the new revolution of agriculture starts with these AI technologies.

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