



Science

PROJECT AGRO

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Abstract

Agricultural is the backbone of Indian economy. India is the second largest country in the production of agricultural product. Farmers cultivate their crops against problems like monsoon failure, lack of water availability, etc. But even after they harvest their crop they are not getting proper marketing facility for their crop. We are proposing a system which reduces the gap between farmers and the consumers, which increases economic status of farmers and also provide the necessary knowledge required by the farmers for further crop production. In the survey the following details are gathered from the farmers, farmer's details, past crops grown by them, area of agriculture land owned by them, past crop selling price, location of agriculture land, water availability etc. On the above details artificial neural nets machine learning models and Bayes data mining concepts are applied thorough which we can predict the current market for farmers along with that we can also provide the information about the type of crop they can grow to increase the crop production in future.

Keywords: Farmers Market; Crop Prediction; Artificial Neural Nets; Bayes.

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1. Introduction

Agricultural is the backbone of Indian economy. Around 70% of Indians directly or indirectly depends on agriculture. In the worldwide farm output India ranks second. The word agriculture is derived from the Latin words where ager and culture referring to the soil and its cultivation respectively. Agriculture can be defined as the cultivation and production of crop plants or livestock products. Even though these many people are depending on agriculture they are not getting proper facilities in all the areas, and there is no proper management system which will help farmers, middleman, and retailers. While our system mainly targets on farmers and providing them the knowledge of market, price and quality of crops, requirements and

knowledge of crop production, it also helps other people included in agriculture development by easing their path and provides them a proper structure for their work.

1.1. Background

The history of human and agriculture go hand in hand. Agriculture is the reason that made human to settle at a selected spot cultivation. This lead to the formation of society and created the path for civilization. Settled life lead to the implementation of techniques in agriculture. Agriculture in India is depending on monsoon. Evidence of water reservoirs are found in Hindus valley civilization which resembles better water management facility. After Independence in 1947 our Indian constitution took several steps to improve agriculture in India they include Green revolution, White and yellow revolution etc. Currently Government of India is working on using technology and scientific methods in agriculture to increase the crop production.

1.2. Problems Faced by Farmers

The contribution of agriculture and its allied activities in India's GDP is declining every year. In 2009-2010, it was 14.6% and it's declined to 13.9% in 2013-2014. Along with that the rate of farmer suicide is also increasing. In the year 2004 around 18,241 farmers committed suicide which is highest number ever recorded. [2] In India the farmer's suicide rate has ranged between 1.4 and 1.8 per 100,000 total populations, over a 10-year period through 2005. Around 11.2% of suicides in India is accounted by farmers [1].

Farmer suicides for not getting proper yield for some reasons like issues in weather and climate, high amount of debt, use of old and traditional cultivation methods, lack of storage facilities, lack of good seeds, fertilizers, insecticides and pesticides. The study concentrates on High debt burdens and genetically modified crops problems of farmers. [3][4][5][6]

2. Existing Systems

Our Government of India has taken many measures to improve agricultural production in India like cold storage facilities, hybrid seeds, fair price, crop insurances, centers that provides information about cultivating crop etc. Government is digitalizing agriculture by implementing technology in agriculture. Our Indian governments have created mobile applications, and they also provided tablet computers to give necessary information about growing crops, market requirements, storage facilities, new inventions in cultivation. They include following websites,

2.1. Agriculture Cooperation & Farmers Welfare

This government websites that provides the information about Agricultural Marketing, Agriculture Censés, Budget, Cooperation, Credits, Crops & NFSM, Drought Management, Economic Administration etc.

2.2. E-Agriculture

An international Agricultural Blog which publishes papers and other details regarding the new inventions and survey details in Agricultural field.

2.3. Farmer's Portal

It provides details about Seed distribution Centre, Cold storage, Market price, Soil testing Centre etc. nearby farmer.

3. Materials and Methods

3.1. Artificial Neural Networks

Artificial neural networks resemble and built on the basis of biological neural nets i.e., based on our brains neurons and interconnections between neurons. What makes our brain more powerful and faster in analyzing things is parallelism and combinations of outputs. Every time we learn something the weightage between neurons changes i.e., weights on linkages between neurons changes. By using this Artificial Neural Networks complex patterns and co-relations can be find in any datasets. By below picture we can see how ANN can be used in favour of farmers, for input nodes, past data of crops, soil fertility, water availability, temperature, humidity, current market, weather forecasting details are sent and initially random weights are assigned, processing is done in hidden nodes later when processing reaches output nodes we will get the desired results like crop prediction, future agriculture market trends. And also information regarding quality and quantity of fertilizers will be given.

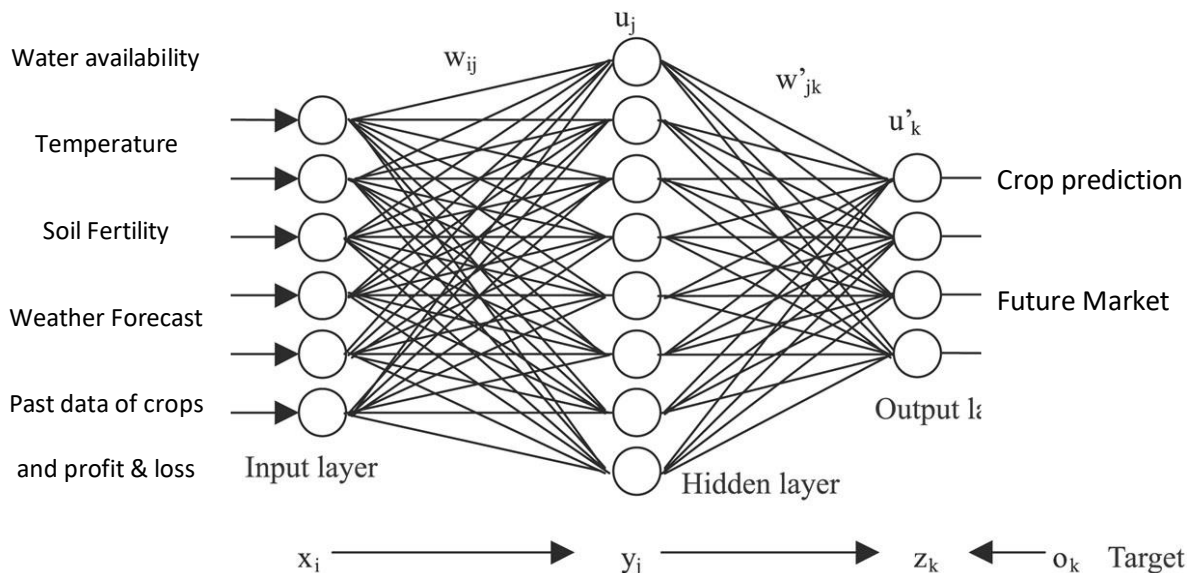


Figure 1: Artificial Neural Nets

3.2. Bayes Algorithm

Bayes or Naive Bayes is a classification technique and it is based on Bayes' Theorem, it work on the assumption of independence among predictors. In simple words, it assumes that there is no relation between one feature and another. This algorithm is very helpful to predict the crops for farmers. When we apply this algorithm all the inputs such as water availability, humidity, temperature, current market scenarios, weather forecasting, and all the other features are independently processed and analyzed by Naive Bayes classifier and output contains set of recommended crops.

3.3. Proposed System

An Online portal which allows farmers to get information about rapidly changing Agriculture market and also predict about future crops which provide optimal profit for farmers.

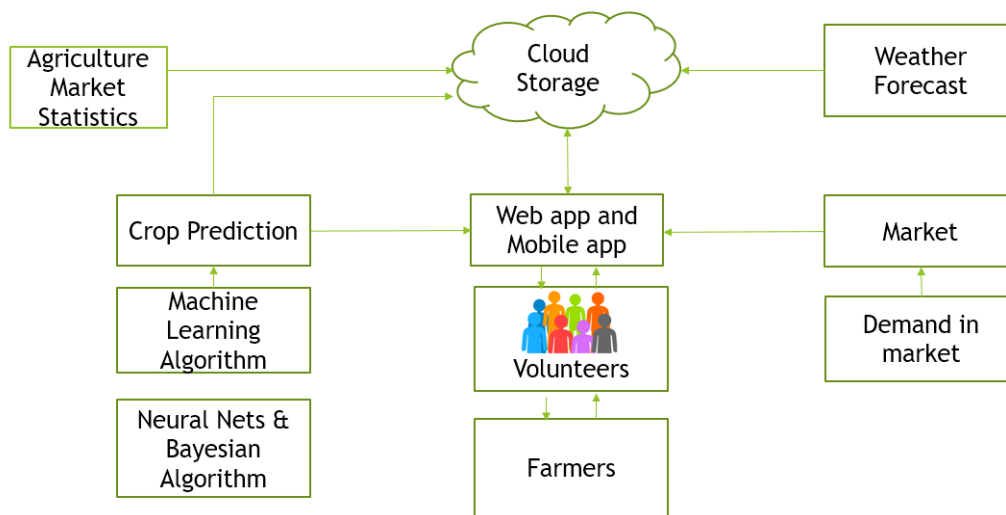


Figure 2: Block diagram of proposed system

In this Online portal (Web Application /Mobile Application) volunteers will be helping in getting data from farmers regarding past crops grown, water availability, temperature, humidity, soil fertility, Agricultural land area of farmers, and also data regarding Agriculture Markets will be updated in the cloud frequently. Later Machine Learning Algorithms (Bayes algorithm and Neural Nets) are applied to get information regarding which crop should be grown, which crop has more demand in the present market, and which is the right market place for crops of farmers. Volunteers plays an important role in this system, because when we see the existing system or the Government websites/portals they are already working on this problem but the approach is not efficient, they are providing mobile tablets and internet for the farmers and also the training to use them, but unfortunately major proportion of farmers are illiterates, so training them in using internet and other technologies are not yielding the proper output. In our proposed system “volunteers“ plays as interface between the technology and farmers, hence the gap created can be filled and modern technologies can be utilized in Agriculture.

4. Conclusions

By providing the medium between farmer and the consumer, economic status of farmer can be increased which simultaneously decrease the farmer suicide rate. Predicting the crop for farmer to be grown in future will help them to increase the crop production. Efficiency of the system depends on the data gathered from farmers; the information collected should be authentic and accurate. Since information on how to use resources like water, pesticides, quality and quantity of fertilizers will be given to farmers which help in maintaining the fertility of soil.

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