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EFFECTIVE CROP YIELD PREDICTION

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ABSTRACT

Agriculture is an area where a lot of uncertainty exist. Crop production is totally depended on number of factors like geography, weather, biological, political, and economical. Indian financial system is mainly driven by farming and provides service opportunity in farming sector. Apart from this, there is a large amount of raw agricultural data is present, but they are very complicated for yield estimation of crop. So the most difficult task is to bring meaningful information and knowledge out of the raw agricultural data. Data mining can tailor data knowledge to estimate the crop yield. The aim of the research paper is to estimate crop yield by implementing data mining techniques.

Keywords:Data Mining,Dataset, Prediction, Soil Type, Support Vector Machine, Artificial Neural Network.

1.INTRODUCTION

Agricultural intelligent decision system provides answers according to authoritative experts in related fields for those application problems that need expert knowledge or a knowledge base in a specialized field to solve Agricultural intelligent decision system has a large number of authoritative experts in agriculture experience, information, data and results constitute the knowledge base. It can use its knowledge and method to solve the problem of simulation of agricultural expert judgment. Intelligent decision system can solve the problems of agricultural production.

Indian agriculture recognized for different types of crop production, mainly due to change in resources. India is a country of the rural economy Crop yield projections and estimation are critical areas of research used to make sure food safety around the world and the Indian financial system. [1]. India is a global agricultural force. Each year we are getting a high production of yield from preceding year. This more production in successive years totally depends on impact of various crop factors, efficiency of estimation and forecasting technique. Crop forecasting and estimation are very important for developing new government policies that actually give impetus to crop production. The country is cultivate about 63% is treated with rain, while 37% is irrigated.

2.LITERATURE SURVEY

Big Data Analysis Technology Application in Agricultural Intelligence Decision System.

Ji-chun Zhao Jian-xin Guo et. Al. [1]The rapid development of big data technology provides a new technical means for the research and

development of agricultural intelligent decision system. It can effectively improve the processing speed and accuracy of the agricultural intelligent decision system, and can provide guidance for agricultural production. The application of big data analysis technology and artificial intelligence technology in the agricultural intelligent decision system is the next development direction.

Estimation of Major Agricultural Crop with Effective Yield Prediction using Data Mining.

Rajesh Kumar Maury, Sanjay Kumar Yadav, Tarun Kumar Sharma et. Al.[2] To analyze and forecast the crop production, statistical model technique MLR applied on the data set having 382 records of Ghaziabad district Uttar Pradesh with different parameter such years, season, crops, area and production. In this study, four major crops production of different year and different season (rabi, kharif and summer) were compared and analyzed. For analyzing the data ANOVA Single-Factor and Two- Factor with replication based study has been conducted. Similar process can adopted for other crops to authenticate the validity of yield prediction. They has been observed that of more effective techniques that can be developed to find the solution of complex agricultural issue using DM techniques. The obtained results were verified and analyzed through statistical software IBM SPSS package.

3. PROPOSED SYSTEM

The crop yield prediction with all of its essential parameters that are needed for the well yield of crop. This improves the classification result of the crop yield. All the essential parameters are thought-about as inputs. In common, one in all the issues faced with in the prediction method is that almost all of the required parameters that are essential to consider for the exact prediction are not consider. It decreases the efficiency of the anticipated result which leads to lack of proper forecasting of the crop harvest. Additionally, its tougher to predict the developed range of input parameters that are to be recognized for the prediction procedure.

Crop prediction is actually defined as predicting crop yields and manufacture before the yield really takes place. Before crop yield and harvest prediction was done by considering the farmer's knowledge on a selective field and crop. This function gives a system called data processing strategies so it is used to predict the analyzed datasets. The forecast type can specify the yielding of crops.

Architecture is a system that unites its parts or components into a coherent and purposeful complete. The crop information base consists of farm data like crop varieties, crop year, area and seasonal parameter like Kharif, rabbi and summer crops. The knowledge-based data contains the details about zones furthermore district information, ecological parameter like extreme and lowest temperature value and average precipitation. The crop yield prediction model takes respective input from the farmer using input modules that includes crop name, land area, soil type, water resources, crop year and prediction tons. The feature selection model is in charge offset. Selection of associate attribute from crop particulars. The crop yield prediction model used to predict the effective crop yield using data mining. After feature selection, the data go through classification rule which groups similar contents. Climate data and crop parameters are used for predicting the crop growth. Then prediction rules are going to be applied to the output of classifying crop particulars in terms of crop name, season and total yield details.

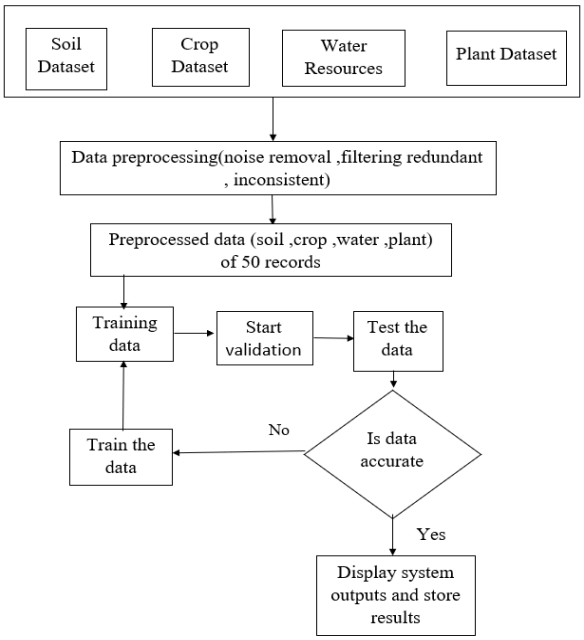

Fig 3.1 Architectural diagram.

Modules:

A. Data Extraction: It is the process of retrieving data out of data sources for further processing. Here, The datafiles hold different dataset and extract particular data the source whenever necessary.

B. Data Selection: The process where data relevant to the analysis task are retrieved from the database. i.e., fetching the data from the relevant dataset.

C. Pre Processing: To train the data with the set of inputs so that it will show the absolute output to the user. The ANN(Artificial Neural Network) and SVM(Support Vector Machine) help in training the inputs of the farmer and plot the graphs.

D.Prediction: The crop yield prediction model takes respective inputs from the farmer using the input module which has crop name, land area, crop year and prediction tons. The feature selection model is in charge offset. Selection of associate attribute from crop particulars. The crop yield prediction model used to predict the effective crop yield using data mining. Once feature selection, the data go through classification rule which groups similar contents.

Advantages:

- Helps farmers in providing the historical crop yield record with the forecast reducing the risk management.
- Helps the one who are new to farming business.
- It improve and authenticate the validity of yield prediction which are useful for the farmers for the prediction of a specific crop.
- In the subsequent work a comparison of the crop yield prediction can be made with the entire set of existing available data and will be dedicated to suitable approaches for improving the efficiency of the proposed technique

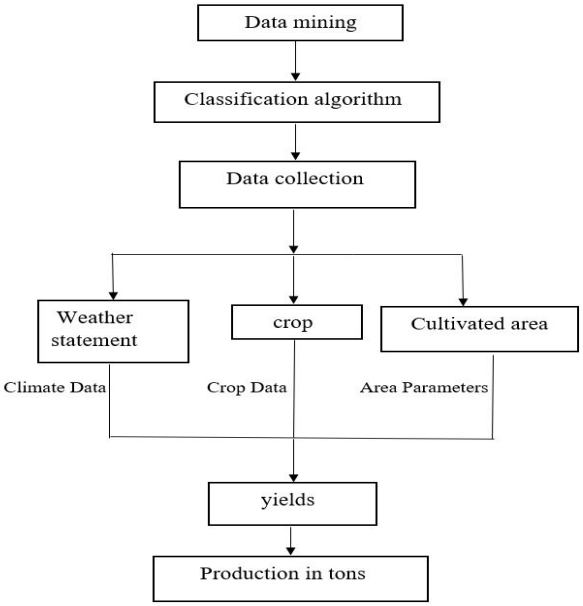

Fig 3.2 Modules description.

4. IMPLEMENTATION

Artificial Neural Network (ANN):

ANN is very useful algorithm in forecasting agricultural crop yield using different crop performance factors Biological nerve organization is the basis of ANN. Agriculture, farming method is very multifarious since it deals with the large data situation which comes from large number of factors. It consists of set of interconnected neurons. Connection between neurons is links and having weight associated with it.

Support Vector Machine(SVM):

SVM algorithm is help to forecast the category of crop based on number of factor of crop and soil of crop yield estimation SVM is the specific discriminatory selection of various factor of crop by the excellent interval. SVM is an automated learning algorithm under supervision that can also be used for classification or regression challenges.

5. RESULT

The web pages provides the yield of crops with their seasonal disease and also It will predicts highest crop production.

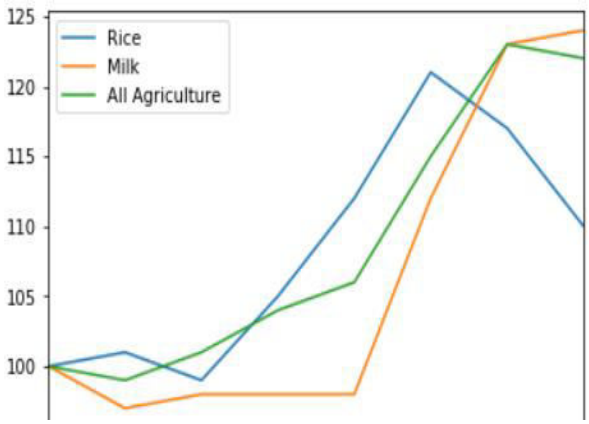

Fig 5.1 Rice production has decreased in comparison to all agriculture.

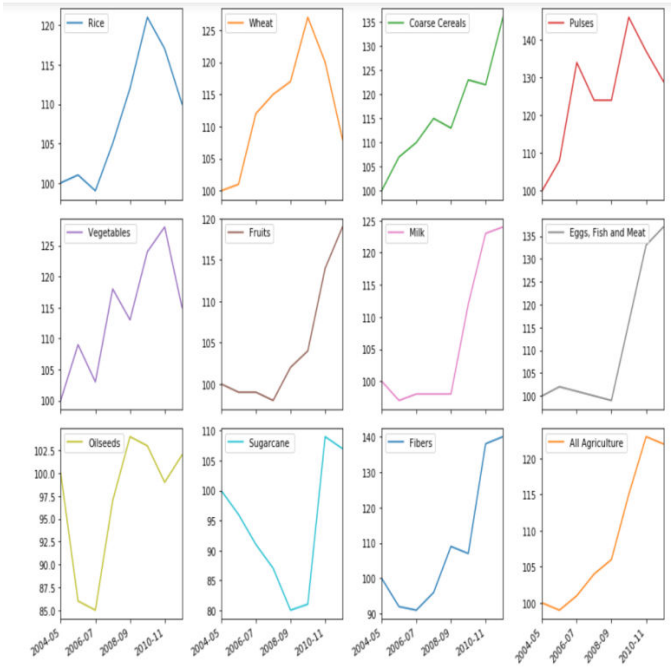

Fig 5.2 Milk has exponential increase in production from 2008-09 to 2010-11. Rice, wheat, vegetables and pulses had steep decline in production from 2010-11 to 2011-12. Overall for all agriculture the production has increased from 2004-05 to 2011-12.

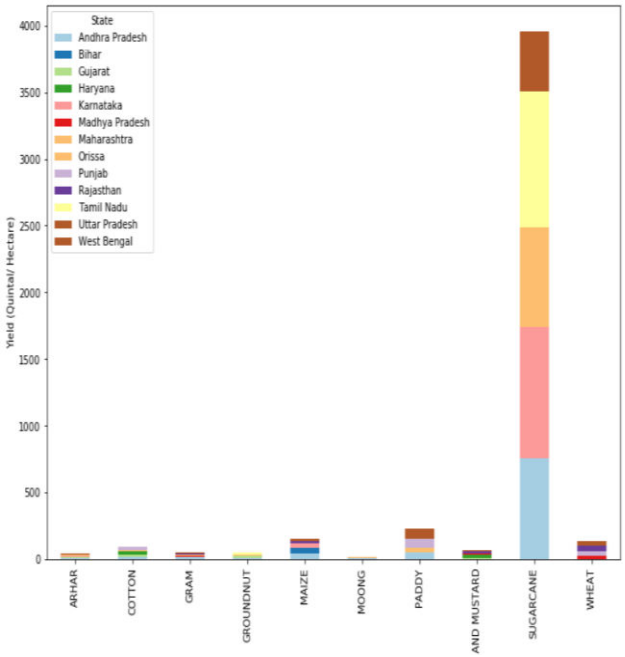

Fig 5.3 Bar chart provides information of yield of different crops. As yield of different crops vary a lot, sugarcane yield (Quintal/ Hectare) is much more as compared to other crops so it makes this plot much less informative. We will make this plot state wise to make it more informative.

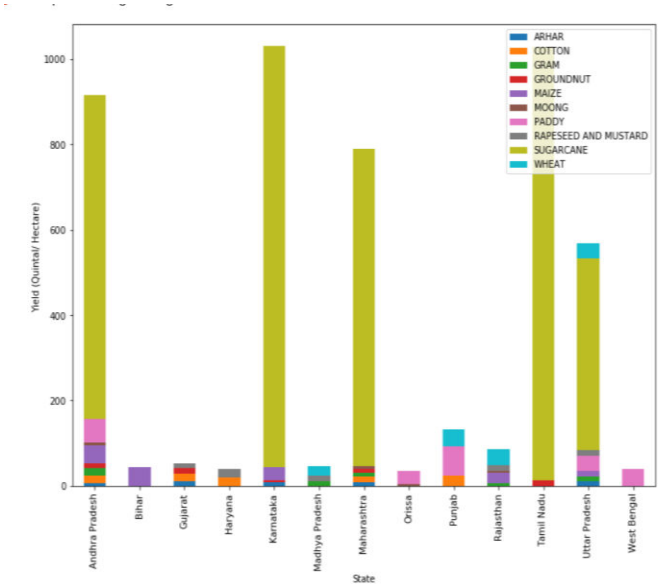

Fig 5.4Andhra Pradesh has data on maximum number of crops and Tamil Nadu has maximum yield of Sugarcane.

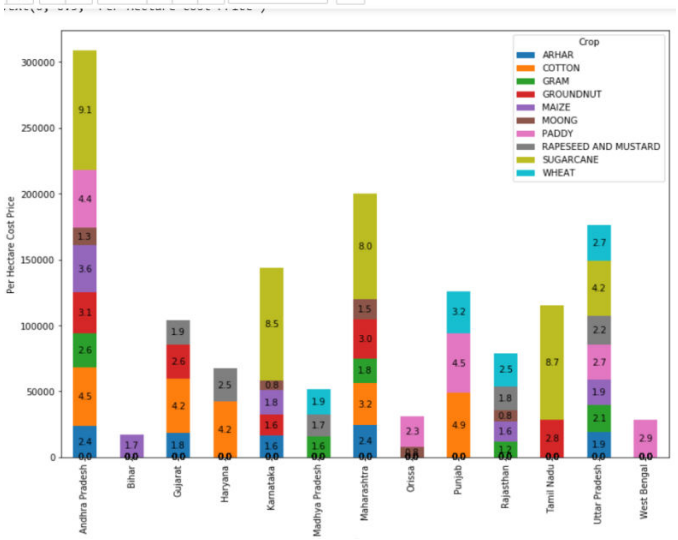

Fig5.5The plot helps us to compare per hectare cost of different crops across different states. For formatting reasons, cost values are added as factors (actual value/10000 rounded to one digit). You can clearly see Uttar Pradesh has lowest per hectare cost for sugarcane but it has lowest yield as well (inferring from previous plot).

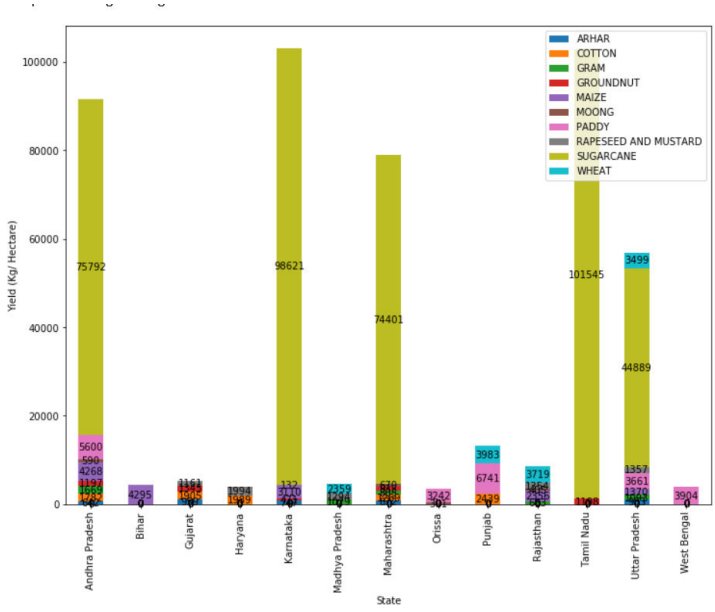

Fig 5.6Compare yield of different crops across different states. Due to large number of values, the plot is not formatted well.

6. CONCLUSION AND FUTURE ENHANCEMENT

In accurate prediction of different specified crop yields across different districts will help theupcoming farmers of India. Yield estimation models are utilized in preciseness Agriculture to extend yield production to satisfy demand and to recommend to the government in regard to prediction crop yield on imports of Trichy, Tamil Nadu dataset to avoid overlapping. Simultaneously, the regression rules were tested for the yield prediction capabilities. The readings were used for input model. Linear

regression algorithms offered acceptable estimation accuracy, though higher prognostic power could also be obtained by parameters such as year, crop, area, production (in tons) and alternative variables such as climate, agricultural practices and soil characteristics are included within the model development.

The model using linear regression can be suggested for Ecuadorian conditions. In yield prognostic models are not existent for any crop. From this proposed system the yield of crop (sugarcane, cotton, and turmeric) are predicted in highest level. This model may be reformulated using alternative crop assessments within the future, to develop methods for increasing yield and land territorial management in alternative crops of importancelike wheat, rice and so on.In future, the android application can be developed using some programming languages.

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