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# Estimation of Major Agricultural Crop with Effective Yield Prediction

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**ABSTRACT:** Agriculture is an area where the most uncertainty exists. Crop production is totally dependent on a number of factors like geography, weather, biological, political, and economical. Indian financial system is mainly driven by farming and provides service opportunities in the farming sector of Indian Financial system is higher than the world's average (6.4%). Agriculture (17.32%), Services (53.66%) and Industries (29.02%) are mainly contributing in the GDP of the nation. The prognostication of agriculture yield is challenging and pleasing task for every nation. Nowadays, Farmers are hostels to produce the yield because of erratic climatic changes and security of water resource. The main objective is collecting agricultural data which can be stored and analyzed for useful crop yield forecasting. Apart from this, massive amount of raw agricultural data is present, but analysis these facts are very complicated for yield estimation of crop. To predict the crop yield with the help of data mining technique, advanced methods can be introduced to predict crop yield and it also helps the farmer to choose the most suitable crop, thereby improving the value and gain of the farming area. Agrarian sector in India is facing rigorous problem to maximize the crop productivity. More than 60 percent of the crop still depends on monsoon rainfall. Recent developments in Information Technology for the agriculture field has become an interesting research area to predict the crop yield. The problem of yield prediction is a major problem that remains to be solved based on available data. Data Mining techniques are the better choices for this purpose. Different Data Mining techniques are used and evaluated in agriculture for estimating the future year's crop production. 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 this research paper is to estimate crop yield by implementing data mining techniques.

**KEYWORDS:** Statistical Approaches, DM Technique, production estimation, tracking patterns, Classification, Cluster based Analysis, Linear regression Analysis (LRA), Multiple Regression Analysis (MRA) using SPSS.

## I. INTRODUCTION

Indian agriculture is 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 ensure food safety around the world and the Indian financial system. India is a global agricultural force. Each year we are getting a high production of yield from the preceding year. This more production in successive years totally depends on the 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 cultivating about 63% is treated with rain, while 37% is irrigated. There were some achievements in the United States, China, and Japan and European countries. Since the 1990s, with the rapid development of computer technology, AI technology, database technology, 3S technology and automation control technology, agricultural information technology has entered a new development period, and intelligent agriculture decision systems have been developed successively. Intelligent Agriculture decision systems are mainly a variety of intelligent technology integration in the field of decision systems, such as neural networks, WEB technology, intelligent greenhouse, technology, the use of modern means of data processing, and new processing of data. The information technology the connotation of agricultural decision system, which improves the decision accuracy, intelligence and practicality. The single function of the agricultural decision system in this stage is the initial stage of the agricultural decision system. The time is at the end of 1970s to early 80s.

## II. RELATED WORK

### BIG DATA ANALYSIS TECHNOLOGY APPLICATION IN AGRICULTURAL INTELLIGENCE DECISION SYSTEM

The rapid development of big data technology provides a new technical means for the research and development of agricultural intelligent decision systems. 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.

### ANALYSIS OF CROP YIELD PREDICTION USING DATA MINING

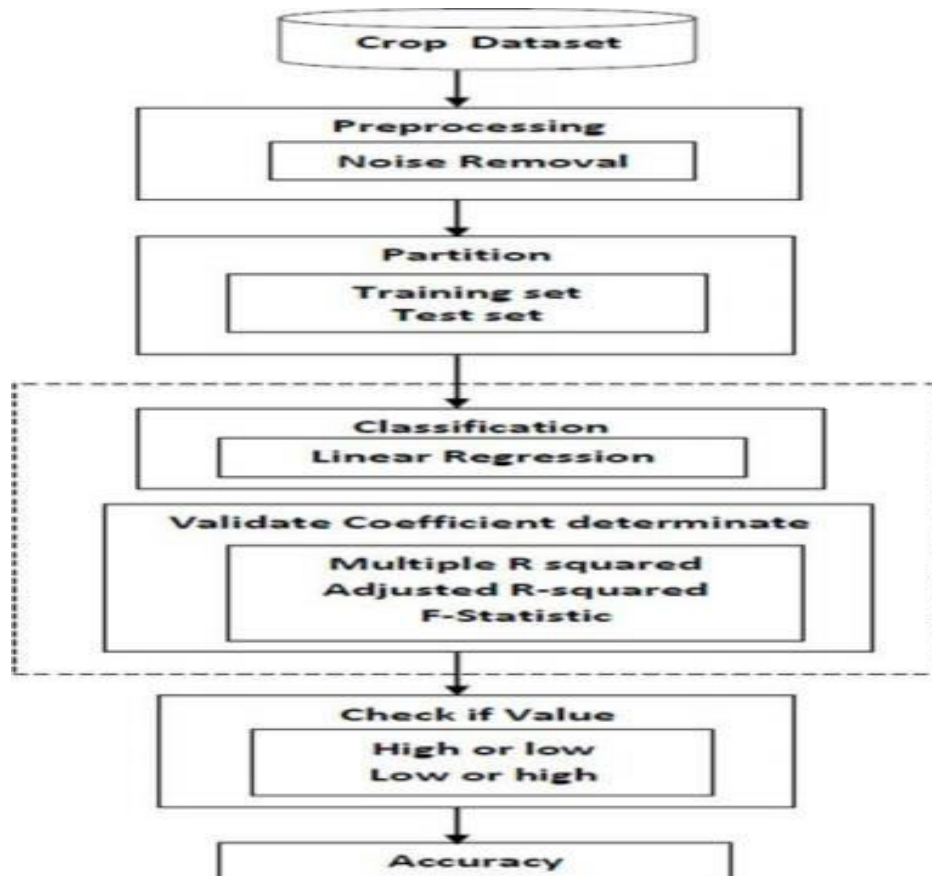
Initially the statistical model Multiple Linear Regression technique is applied to one existing data. The results so obtained were verified and analyzed using the Data Mining technique namely Density-based clustering technique. In this procedure the results of two methods were compared according to the specific region, i.e. East Godavari district of Andhra Pradesh in India. Similar process was adopted for all the districts of Andhra Pradesh to improve and authenticate the validity of yield prediction which are useful for the farmers of Andhra Pradesh 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.

### SURVEY ON DATA MINING TECHNIQUES IN AGRICULTURE

According to him the decision trees suggested there exists a correlation between climatic factors and soybean crop productivity and these variables' influence on the soybean crop productivity were confirmed from the rule accuracy and Bayesian classification.

## III. METHODOLOGY

BLOCK DIAGRAM:



The research paper is to estimate crop yield by implementing data mining techniques. The crop yield prediction includes repeatedly all essential parameters that are needed for the well yield of the crop. This improves the classification outcomes of the crop yield. All the essential parameters are thought-about as inputs. In common, one in all the issues faced with the prediction method is that almost all of the required parameters that are essential to consider for the exact prediction are not considered.

#### IV. EXPERIMENTAL RESULTS

	Area Abbreviation	Area Code	Area	Item Code	Item	Element Code	Element	Unit	latitude	longitude	Y1951	Y1952	Y1953	Y1954	Y1955
0	70	2	41	2511	74	5142	Food	1000 tonnes	33.94	67.71	1928.0	1904.0	1955.0	1950.0	2001.
1	70	2	41	2505	113	5142	Food	1000 tonnes	33.94	67.71	183.0	183.0	182.0	220.0	220.
2	70	2	41	2513	29	5521	Feed	1000 tonnes	33.94	67.71	75.0	75.0	75.0	75.0	75.
3	70	2	41	2513	29	5142	Food	1000 tonnes	33.94	67.71	237.0	237.0	237.0	238.0	238.
4	70	2	41	2514	16	5521	Feed	1000 tonnes	33.94	67.71	210.0	210.0	214.0	215.0	216.
5	70	2	41	2514	16	5142	Food	1000 tonnes	33.94	67.71	403.0	403.0	410.0	415.0	415.
6	70	2	41	2517	9	5142	Food	1000 tonnes	33.94	67.71	17.0	18.0	19.0	20.0	21.
7	70	2	41	2520	66	5142	Food	1000 tonnes	33.94	67.71	0.0	0.0	0.0	0.0	0.
8	70	2	41	2531	55	5142	Food	1000 tonnes	33.94	67.71	111.0	97.0	103.0	110.0	113.
9	70	2	41	2536	79	5521	Feed	1000 tonnes	33.94	67.71	45.0	45.0	45.0	45.0	31.

FIG.1 ABOVE DATA REPRESENTS CROP EXPERIMENTAL STATUS 1

	Area Abbreviation	Area Code	Area	Item Code	Item	Element Code	Element	Unit	latitude	longitude	Y1951	Y1952	Y1953	Y1954	Y1955
0	70	2	41	2511	74	5142	0	1000 tonnes	33.94	67.71	1928.0	1904.0	1955.0	1950.0	2001.
1	70	2	41	2505	113	5142	0	1000 tonnes	33.94	67.71	183.0	183.0	182.0	220.0	220.
2	70	2	41	2513	29	5521	1	1000 tonnes	33.94	67.71	75.0	75.0	75.0	75.0	75.
3	70	2	41	2513	29	5142	0	1000 tonnes	33.94	67.71	237.0	237.0	237.0	238.0	238.
4	70	2	41	2514	16	5521	1	1000 tonnes	33.94	67.71	210.0	210.0	214.0	215.0	216.
5	70	2	41	2514	16	5142	0	1000 tonnes	33.94	67.71	403.0	403.0	410.0	415.0	415.
6	70	2	41	2517	9	5142	0	1000 tonnes	33.94	67.71	17.0	18.0	19.0	20.0	21.
7	70	2	41	2520	66	5142	0	1000 tonnes	33.94	67.71	0.0	0.0	0.0	0.0	0.
8	70	2	41	2531	55	5142	0	1000 tonnes	33.94	67.71	111.0	97.0	103.0	110.0	113.
9	70	2	41	2536	79	5521	1	1000 tonnes	33.94	67.71	45.0	45.0	45.0	45.0	31.

Fig.2 Above Data represents Crop Experimental Status 2



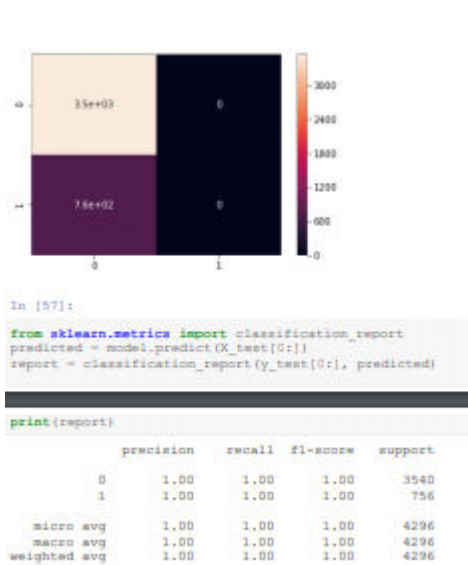


Fig 3 Table Representation of crop predication 1

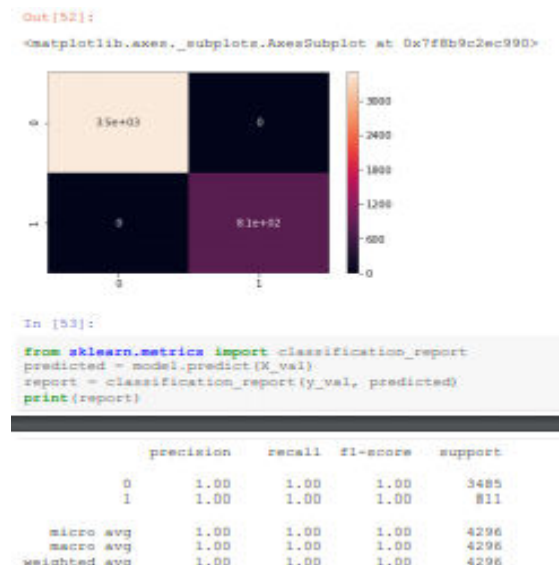


Fig 4 Table Representation of crop predication 2

All agricultural experimental data sets were analyzed using SSPS library. IBM SPSS offers a variety of data, text analysis in a research environment that has the good collection of statistical algorithms for Classification, processing and association rules. It has been observed that more effective techniques that can be developed to find the solution of complex agricultural issues using DM techniques. The obtained results were verified and analyzed through statistical software IBM SPSS package.

## V. CONCLUSION

In accurate prediction of different specified crop yields across different districts will help farmers of India. Yield estimation models are utilized in precise. Agriculture to extend yield production to satisfy demand and to recommend to the government in regard to prediction crop yield on imports of Trichy, Tamilnadu dataset to avoid overlapping. During this work the regression approach was tested in their yield prediction capabilities. The readings were used for model inputs. Linear regression algorithms offered acceptable estimation accuracy, though higher prognostic power could also be obtained by parameters like year, crop, area, production (in tons) and alternative variables, like 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 at the 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 importance, like wheat, rice.

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