Soil Texture Based Crops Improvement Through Big Data Analytics

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ABSTRACT – The *Soil Texture is very important for the growth and yields of crops. The selection of crops depends on the Soil Texture. Generally, the soil texture is the Propionate of Sand, Slit, and Clay. In soil management, the soil proponent is in an up-land and lowland. The Soil Texture prediction is an important agricultural problem for farmers and it can be predicted with the help of previously available soil dataset. The soil is the basic and essential input in agricultural productivity of crops. In this paper, the crop selection is predicted using the soil texture and the factors which influence the development of agricultural sectors. The soil texture mainly depends on several parameters such as EC, pH of soil texture and terrain analysis. This paper aims in at analysis of soil dataset using big data analytics.*

Keywords: *Soil Texture, Upland, Lowland, Soil Propionate.*

1. INTRODUCTION

Soil texture refers to the relative proportion of sand, silt and clay fraction present in the soil. The texture of the surface layer or the plough layer plays an important role in influencing the growth and yield of crops, used to identify and important parameter used to identify the phases of soil series. The Soils texture plough may be described in different ways by different people for their different purposes. Soil is the identifiable patterns, Agriculture is particularly basic reasonable of grouping soil. A type of soil is very useful for the cultivation of crops; characteristics of soil reduce losses of productivity. The soil is very useful for classifying them into different type using different methodologies it is important to evaluate a relationship between these factors to forecast crop yield and maximize production. Land type is one of the important factors and different land types are suitable for various types of crop productions medium highland and highland uniquely suitable. One of the most important issues that need to be considered is the type of soil and the suitability of the crops. Soil and the classification

are referring to the attributes needed for classification such as soil characteristics, soil suitability class, and crop suitability.

2. RELATED WORK

[1] The techniques of data mining are extremely popular in the area of agriculture data processing is employed in a very large area ready to wear data processing system product and domain specific data processing application software are obtainable however data processing in agricultural soil knowledge set may be a comparatively a young analysis field. Soil testing laboratories yet as free messages for the farmer data like soil testing code chemical that is important for the crop.

[2] The standard statistical analysis techniques are both time consuming and expensive. Agriculture research has been profited by technical advance such as automated data mining. Efficient techniques can be developed for solving complex data sets using data mining to improve the accuracy and effectiveness of classification of large soil datasets. The overall goal of the data mining process is to extract information from a dataset and transform it into an understandable structure for further use. A soil test is the analysis of a nutrient content, composition and other characteristics. Soil classification deals with the categorization of soil into different soil classes as very low, low, medium, high and very high of nutrient found in the soil and the basis of these classes fertilizers are recommended for a soil sample.

[3] Soil samples have been collected from 30 to examine the locations spread uniformly over the study area in order to examine the infiltration rate of soils and its impact on the overall crop production process. Double ring infiltration was used to carry out the experimental study. Infiltration rates were taken at 0 to 70 minutes of 10 minute intervals. The assessment of infiltration rate was processed by laboratory analysis of soil samples for the particle size distribution the recommended values for crop production. This will help improve the structure and restore soil potentials.

[4] This paper explains support vector machine based classification of the soil types. Soil Classification includes steps like image acquisition, image pre

processing, feature extraction and classification. The texture features soil image are extracted using the low pass filter, Gabor filter and using color quantization technique. Mean amplitude, standard deviations are taken as the statistical parameter. Classification of soil is the dissolution to soil sets to particular group having a like characteristics and similar manners. Higher agricultural products are very much depends on the soil characteristics, identification and classification is very much important. Soil type helps to avoid agricultural product quantity loss.

[5] The application of two unsupervised methods in classifying type of soil. Soil that is suitable for agricultural activities can be classified into four classes which are hill soil, organic soil and alteration, soil support system is able to classify the type of soil and retrieve the information for a location and suitable plants for local purpose. Classification model the inputs for this study are color, texture, drainage class and terrain.

3.RESEARCH METHODOLOGIES

The dataset is part of primary data for soil texture refers to the relative proportion of sand, silt and clay fractions present in the soil pH are acquired by field sampling. These samples are sent to chemical and physical analysis at the testing laboratories. The soil texture range is required for this work. Dataset need to analysis, comparison accuracy using the predicting soil texture and using an algorithm.

3.1 DATASET COLLECTION

Data set required for this analysis these datasets contained various attributes and their values of soil samples. The dataset is part of primary data for soil pH, key parameters and surface soil texture is acquired by field sampling. These samples are sent to chemical and physical analysis at the soil testing laboratories. This soil texture and dataset required for this work.

3.2SOIL TEXTURE BASED ON CROP IMPROVEMENT

Soil texture is a classified instrument used both in the field and laboratory to determine soil classes based on their physical texture. Soil texture can be determined using qualitative methods such as texture and qualitative methods such as the hydrometer method. Soil texture has agricultural applications such as determining crop suitability and to predict the response of the soil to environmental and management condition such as calcium requirements. There are three basic types of soil, sand, silt and clay. Soil properties affecting plant growth include soil texture aggregate size, porosity, aeration and water holding capacity. An important function of soil is to store and supply nutrients to plants.

Attribute	Description
Ultra acidic	<3.5
Extremely acidic	3.5-4.4
Very strongly acidic	4.5-5.0
Strongly acidic	5.1–5.5
Moderately acidic	5.6–6.0
Slightly acidic	6.1–6.5
Neutral	6.6–7.3
Slightly alkaline	7.4–7.8
Moderately alkaline	7.9–8.4
Strongly alkaline	8.5–9.0
Very strongly alkaline	> 9.0

Table : Soil PH Range

Attribute	Description
pH	pH value of soil data
EC	Electrical Conductivity
OC	Organic
N	Nitrogen
P	Phosphorus
S	Sulphur
Zn	Zinc

Table 1:Soil key Parameters

ACIDIC	NETURAL	ALKALINE
LESS 6.0	7.5 -8	8.6-9.0

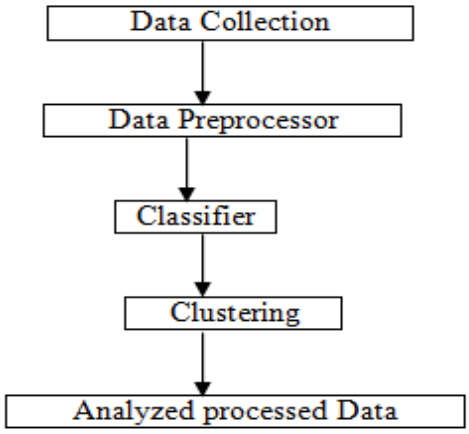
Table 2: PH Soil Range

Texture class	Texture
Loamy sand	Low retention of water and nutrients
Sandy loam	Low intention of water and nutrients
Sandy clay loam	Optimum water and nutrient retention
Clay loam	Optimum water and nutrient retention
Sandy clay	High water and nutrient retention
Clay	High water and nutrient retention

Table3- Surface Soil Texture

5. PROCESS MODEL TO ANALYZE AGRICULTURAL PROCESSING DATA TO PREDICT

Table 1: Analyze Agricultural Data Processing



5.1 Linear Regression Algorithm

The analytics list down the most popular regression algorithm. The simple linear regression is a statistical method that enables the users to summaries and study the relationships between two continuous variables.

5.2 Classification Algorithms

In machine learning - statistics classification is a supervised learning approach to analyze, the data set takes data input given to use this learning to classify each instance to specific class.

5.3 Decision Tree Classifier

The decision tree of supervised machine-learning algorithm is the improvement of classifier data is continually split according to a certain parameter. The tree predicts new occurrences of information.

6. PROPOSED FRAMEWORK

In Proposed system, provides suggestions to farmers, which crop is suitable for pH level soil. The Big Data Analytics Proposed System is used for optimal usage of input and improved profitability to maintain analyses cropping pattern system in land areas is to appropriate for farmer society. The study will highly helpful to the farmer's community to augment the productivity and the profitability data collection of soil texture.

7. CONCLUSION

The agriculture information technology and scenario of decision-making is the better yield for farmers. In this paper analysis of the soil information using completely different Algorithm and prediction techniques for cropping pattern using different algorithm and Techniques. The cropping pattern is to improve the productivity in agriculture.

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