

Crafting procedure to identify fertility for all classified soil.

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ABSTRACT

Food and nutrient are holding a life of livings on the earth. From 'Sind' Culture to this. Modern Culture role of agriculture is same however with respective time and advance in technology as well as use of chemicals, Soil lacks her nutrient. Though the use of external chemicals result in quantitative growth of crop, but internally soil health get suffer from it and one –day it might be loss her fertility. Hence as we need doctors for our health, same way soil testing tools has a vital role in testing the soil for nutrient in soil and test its productivity. Use of computerization and digitization in this agriculture field give the advance features. Like Easy classification of soil on the basis of its different features and also from testing the quality of soil to suggest the additional supplement to improve the health and nutrient in the soil. Key objective of this paper is to capture soil health in concern of nutrient. In this paper, we have shown the classification approach of soil nutrient and detecting the soil health. We have built model using SVM (support vector machine) classifier. Results are compared with standard chart of soil health contains from the agriculture laboratory. Our detection accuracy lies between 95 to 99%.

Keywords: Sind, Nutrients, Productivity, Internally.

I. INTRODUCTION

We can notice that different techniques and tools has been introduced for crop and soil in the agriculture field. Researchers are focusing on improvement in crop productivity and soil health. Classification tools, detection tools, suggestion tools are being developed and modifying using artificial intelligence, Machine learning, Neural network and different classifiers as support vector machine, rule base system classifiers. Brute force classifiers and many more.

Core soil gain and absorb the different minerals and essential metals from the nature. There are 16 main

factors on which the productivity of crop and fertility of soil is depends. These factors get roughly classified into three classes 1-Primary factors, 2-secondary factors and micro metal factors. Primary factor are concern with potassium content, sulphate contains, Hydrogen, Oxygen and nitrogen, carbon, contains. Secondary factors are related to minerals like calcium, magnesium or phosphorus. And other are iron, manganese, copper, zinc, molybdenum, boron and chlorine. If the soil losing her nutrient health it shows the symptoms on crop growth. And hence, if crop get affected without external interference then we can assume that soil has nutrient deficiency.

In this project, we focus on this relation between soil health crop growths because incorrect soil and crop management practice during the cultivation may arise heavy loss in soil quality. We use the features of crop to detect the soil health and her nutrient deficiency. As so, our research base is building a feature extraction model. We have built up this model using mat lab tool. Features of crop like its boundary detection, pigmentation detection, energy relation, HSV of the crop has been captured. And wavelet is used to better classification achievement.

II. LITRATURE REVIEW

From the last few years famine and agricultural industries has facing a problem of soil health. As soil is soul of infinite life and is responsible for sustaining life on earth [1]. According to our survey Agriculture field is in focus for the different reasons from 1875. With the same researches are also involve in it with various objectives. In this section we have taken survey on research work related to models and system used in agriculture area. Few of them are discussing here. Many researchers had started work with classification of soil.

In [1] M.S Sucheta and Maya L Pai, researchers in this field has been given a classification model for the area-wise soil fertility. In their work comparison among the soil samples from the different villages has been compared. There research study was limited to Kerala and parker's nutrient index was considered for measurement. System was design to measure the PH value and FI (fertility index) using ELM learning classifier .System result focus on the fertility of soil is decreasing using the chemical and with the key objective best accuracy obtain by the researchers is 90%.

Researcher [2] Pankaj Panwar, Sharmistha Pal, S. K. Reza & Biplab Sharma (2011) was also had a work on soil fertility index. His result shows that the agriculture land has lower fertility than the forest land.

Result of the work obtain variation of range in 5.32 to 6.56 in agriculture to forest land respectively. This is just because of use chemicals and repetition of same crop. Year by year. As the same H.M Meena and R.S. Sharma conducted the research in Rajasthan to measure the macro and micro nutrient in the soil of Rajasthan [3].

Wller S.S and Dodd J.D [4] also shows that the impact of soil nutrients on the production quantity and quality. He use the example as 'number of flowering culms of tillers grow in clay soil were significantly higher than those grow in sand.'He observation was growth is highly dependent on a rapid mineral cycle. And at end said vegetation on range site of low soil fertility would require more intensive management to insure sustain production, re-growth and survival of the desirable species.

In paper [5] researcher, S.N Nandagawali shows that if the nutrients are available in the right amount for the growth of crop then the yield of crop also increases. Thus the productivity is related the heath of soil. And it can be mange by proper maintenance of water and nutrients in soil. Researcher implement automatic irrigation system. For evaluation of soil fertility, PH value, Temperature, Humidity, soil moisture and its nutrients was considered.

In [6] researchers had discussion about implementation of geo-referenced soil fertility map showing distribution of soil fertility and there special variability. Laboratory analysis soil sample was used in work.

III. PROPOSED SYSTEM DESIGN

The main purpose of the proposed work is to create a suitable model for classifying various kinds of soil series data along with suitable suggestion for improving the fertility of soil.

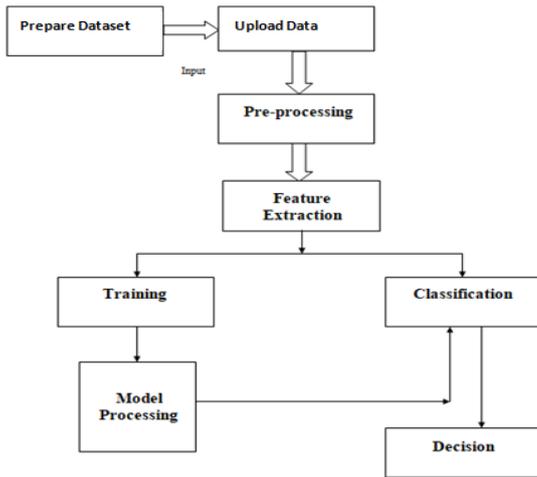


Figure 1: Block diagram of proposed work
 Our main objective is to classify the soil fertility index and suggest the respective crop. With this aim we have taken the laboratory tested soil samples and its contents like PH value, Micro nutrients and primary factors to create a database. Different classes have been created using the factors associated with soil. Few samples are trained and some of them are store for testing. TN (true negative) FN (False negative), TP (true positive) and (False positive) values are use for computing the accuracy .

FPR- False positive rate is the Ratio of samples classified incorrectly ‘FP’ to the actual number of normal records ‘TN’. It is calculated as-

$$FPR = \frac{FP}{TN + FP} \dots\dots\dots eq(2)$$

TPR-True positive rate is the ratio of sample classified correctly for a specified class to the actual total samples of that class. It can be formulated as-

$$TPR = \frac{TP}{TP + FN} \dots\dots\dots eq(3),$$

Detection Rate: It represent the rate of correctly identified considering all instance predicted. In practical setting it may represent as-

$$DR = \frac{TP}{TP + FP} \dots\dots\dots eq(4)$$

Accuracy: Accuracy Value is the ratio of number of sample correctly classified by the system to the total number of total samples. It can be calculated as-

$$Accuracy = \frac{(TP + TN)}{(TP + TN + FP + FN)} \dots eq (5),$$

These are various terms which are use to calculate the result of hybrid intrusion detection system.

IV. RESULT AND CONCLUSION

There are many factors that determine the soil fertility. This depend on the soil classification, Generally, evaluated soil fertility depend on several parameter such as texture , organic matter, soil PH, electrical conductivity, total calcium carbonate, total Nitrogen, C to N ration, available content of phosphorus, potassium , calcium, magnesium and also on the micro nutrients.

Researchers	Average Accuracy	Method
M.S Sucheta and Maya L Pai	90%	ELM classifier and NN
Proposed Method	95-98%	SVM classifier Image processing

V. REFERENCES

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