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Analysis of Chemical Parameters of Soil Samples from Areas of Anand District, Gujarat, India

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Abstract – Analysis and study of soil samples from different areas and regions of Anand district based on physicochemical parameters such as Electrical Conductivity (EC), pH, Calcium, Moisture(percent), magnesium and Organic Carbon(percent). The physicochemical parameters of the soil decide the adaptability of the soil to cultivation. And also determine the amount of biological activity that the soil can sustain. This analysis and research is followed by increase in anthropogenic and industrial activity across this region. The deviation of values was observed in the different parameters due to the soil quality in the multiple regions and sites.

Key Words: **Morphology**, **Anthropogenic**, **Micronutrients**, **Physicochemical parameters, Fertility**, **Soil.**

1. INTRODUCTION

The main utility and the most important factor for Human life and wildlife is Food and its cultivation. The nutrition which human body extracts is from food. Perhaps, for nutrition, life, livelihood and healthy living human life as well as wild life is dependent indirectly on the soil. Soil is a blend of rocks, organic matter, liquids and Myriad of plant-supporting micro- and macro-organisms Life. Soil as a general term typically denotes the unconsolidated thin, variable layer of the normally biologically active mineral and organic material that covers the majority of our planet's flat surface. Soil properties which are prone to management, changes can be used as indicators.

1.1 SAMPLING AREA

The sampling was done from the agricultural land of the seven areas of the Anand district, they are: Anand city, Samarkha, Vallabh Vidhyanagar, Borsad, Karamsad, Petlad and Bakrol. Anand district is located in Gujarat state of the western India. It covers the total of 3204 km^2 of the area. It is a home to many leading industries such as DURAVIT, ELECON and AMUL DAIRY.

2. MATERIALS AND METHOD

Soil samples were collected from seven different agricultural sites in the depth of about 0-30cm from the soil surface. These samples are from Anand city, Samarkha, Vallabh Vidhyanagar, Borsad, Karamsad, Petlad and Bakrol. These are denoted in the table as A1, A2, A3, A4, A5, A6 and A7 respectively. The samples immediately after the collection were stored in the sterilized polyethylene bag. All the chemicals and reagents used for analysis of the physicochemical parameters were of A.R. grade and testing and titration was done in the sterilized and calibrated instruments.

Table -1: Methods of Analysis

S.N.	Physicochemical Parameters	Method
1	Electrical conductivity	Conductometry
2	pH	pH metry
3	Magnesium	Titration
4	Organic carbon	Titration
5	Calcium	Titration
6	Moisture	Weighing

2.1 RESULTS AND DISCUSSION

Parameters	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**
pH	**6.7**	**7.5**	**7.3**	**6.8**	**7.9**	**7.7**	**7.2**
Conductivity (µs)	**0.14**	**0.15**	**0.15**	**0.22**	**0.32**	**0.25**	**0.21**
Magnesium (ml/100gm)	**2.0**	**5.0**	**3.0**	**4.0**	**5.0**	**6.0**	**2.0**
Calcium(ml/100gm)	**9.0**	**6.0**	**7.0**	**6.0**	**5.0**	**8.0**	**7.0**
Moisture (ml/100gm)	**6.89**	**7.26**	**6.29**	**7.88**	**10.25**	**8.40**	**8.88**
Organic carbon (%)	**0.66**	**0.85**	**1.27**	**0.87**	**0.98**	**1.3**	**1.33**

The pH is most important physicochemical parameter in terms of irrigation and plantation as it determines how acidic or basic the soil is and also whether it is suitable for a specific plant species. It also has very acute impact on the biological microorganism activities and mineral nutrient quality. The pH observed in the collected samples were ranging from 6.6 to 7.7 level. The suggested desirable range by International Agriculture Standard is from 5.8 to 8.3. Samples A1 and A4 show slightly acidic nature relative to other samples. But they range in the desirable range, perhaps, it is feasible.

Electrical Conductivity explicit the ion contents of solution which measures the current passing capacity leading us a clear idea of soluble salts present in the collected soil sample. Dilution of the soil suspension also effects the value of

Electrical Conductivity. The range observed for the collected soil samples were from 0.14 µs to 0.32µs.

Magnesium is naturally available in soil and to the plat in the form of Mg^{2+}. The observed range of magnesium in the collected soil samples is from 2ml/100gm to 6ml/100gm. The desired limit by International Agriculture Standard is from 5-10ml/100gm. The samples show relatively low amount of the Magnesium availability.

Calcium ranges from 5.0-9.0ml/100gm. The desirable suggest limit by International Agriculture Standards id from 5.0-10ml/100gm. Henceforth, All the samples shows the desired amount.

Moisture values from the collected samples show the range from 6.89-10.25. The sample A5 shows relatively high value of moisture.

Natural Organic carbon is the content of Nitrogen index In soil material. In cultivated soil, the source of organic carbon included crop waste, animal manure, cover crops, green manure and organic fertilizer etc. The collected samples show the range from 0.66% - 1.33%.

3. CONCLUSIONS

This research and evaluation of physicochemical parameters for plant growth and soil management is important to farm chemists. It is inferred from the results and it is found that the conductivity of all soil samples observed is very low. Furthermore, in all soil samples the magnesium and calcium content are also found to be relatively lower so that fertilizers containing magnesium and calcium should be added for proper growth and development of the ongoing crop.

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