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Soil Samples Analysis of Daskroi Taluka, Ahmedabad, Gujarat

Abstract:

Soil fertility and productivity is depends on underlying materials in their morphology, physic- chemical parameters and biological characteristics. Plants grow depend on the soils for their nutrients, water and minerals quantity, the soil type is a major factor in determining which types of plants will suitable in any area. To study and evaluate correlation analysis of soil samples for better health and productivity taken from Daskroi taluka, Dist. Ahmedabad. Around this area due to industrialization and other anthropogenic activity the soil has been polluted. Our main focus is on analysis and evaluates soil physical properties like pH, Electrical conductivity (EC), Organic carbon and available nutrients like Phosphorous, Potassium as per Government of Gujarat Agriculture department lab manual under soil health card project.

Keywords: Anthropogenic, Morphology, Micronutrients, Soil analysis, Daskroi

1. Introduction:

For survive life everyone need food and it's obtained from soil after cultivation process. Present scenario insists repeated cultivation necessary to fulfil requirement. So for that we think about the health of soil which is the platform from we get the food. Soil is a naturally occurring porous medium of earth crust that supports to grow plants by absorbing water, minerals and nutrients by roots; and provide mechanical support to the plant. Soil is a reservoir of nutrients required by crops, but not necessarily at optimum levels of immediate availability to plants due to some factors. The purpose of soil analysis is to measure the level of available nutrients. Growth of plant is depends on soil fertility and soil fertility is determined by the availability of macro and micronutrients.

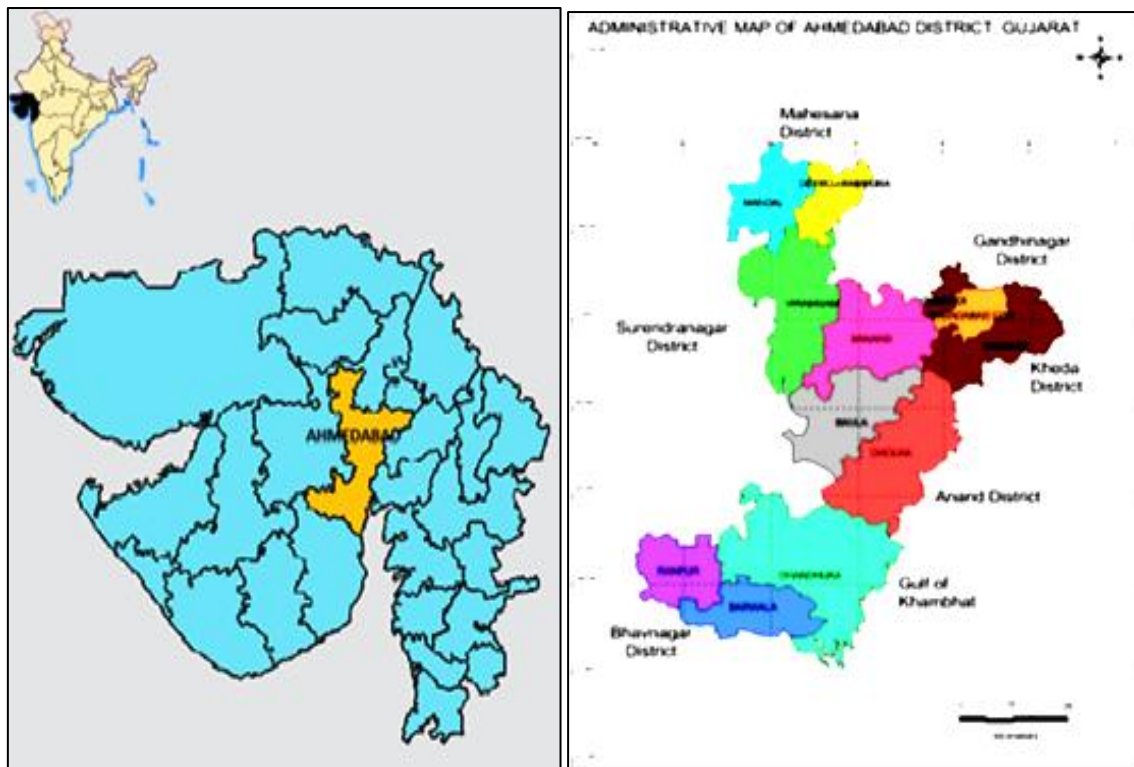
Present study is an attempt to find out the nutrient's quantity in soil Daskroitaluka Ahmedabad, Gujarat. This is the information which helps farmers to decide the amount and the type of fertilizer to be added to soil to make the more productive. In sort the objective of this paper was to analyse the trend in fertility status of soils of Daskroitaluka of Gujarat State.

In this work, analysis is used to study 22 random, medium black and goradu(sandy loam) soil samples collected from different farm sites of Daskroitaluka villages.

2. The Area Of Study:

The area of study is agricultural land of different villages of Daskroi taluka Dist. Ahmedabad. Ahmedabad district is the central part of Gujarat State in western India. It is divided into ten talukas. Daskroi is one of them has 71 villages, covering an area of 656 sq.kms. Daskroi is located between 23⁰.006' North (latitude) and 72⁰.6674' East (longitude). The temperature range is 45°C (max.) and 7°C (min.). Average rainfall is 756 mm.

Major three types of soils, there are medium black, sandy and hydromorphic. Major crops are grains, cotton and different horticulture crops. The data is collecting from different science colleges and STL under the soil health card program by Government of Gujarat, India. We



have selected medium black and goradu (sandy loam) soil samples of Daskroi taluka for present study.

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3. Soil Sampling And Analysis:

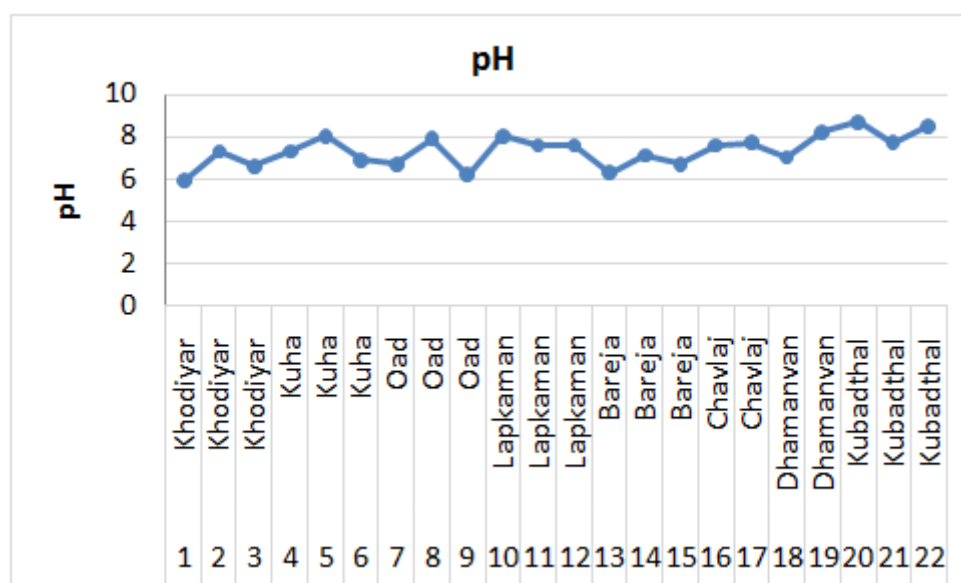
Soil samples were sampled by a systematic sampling strategy at 0 to 20 cm depth below the surface. The samples were dried and passed through a 2 mm sieve to prepare them for testing. All the samples were tested using standard method⁹ by following the “Methods Manual-Soil Testing in India”. The samples were analysed for physical parameters, organic carbon (OC), phosphorus (P), potassium (K), electrical conductivity (EC) and pH.

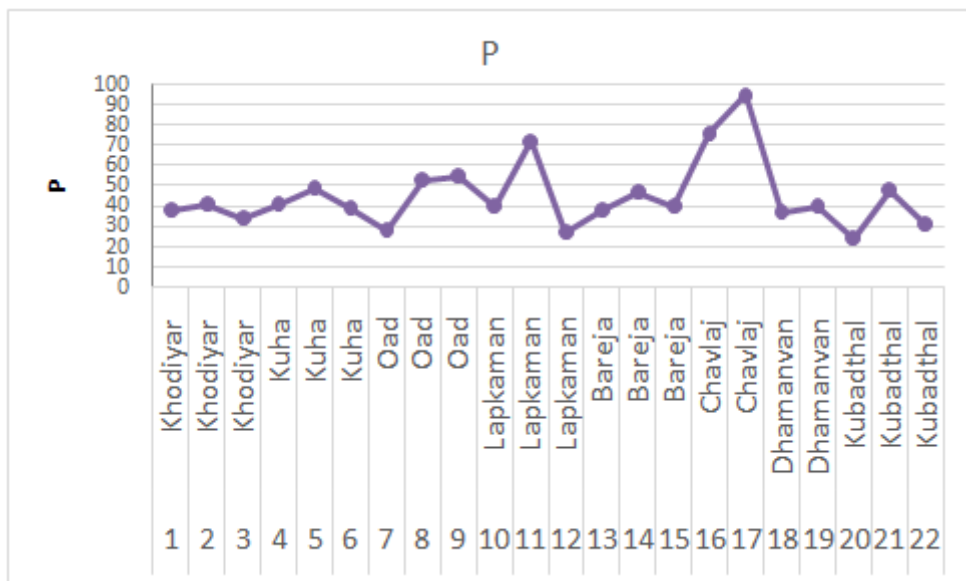
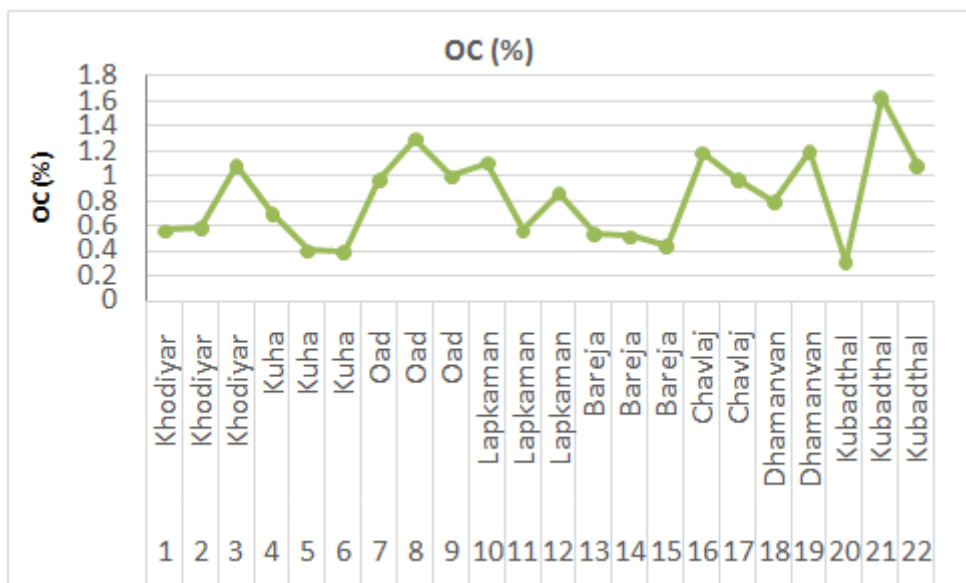
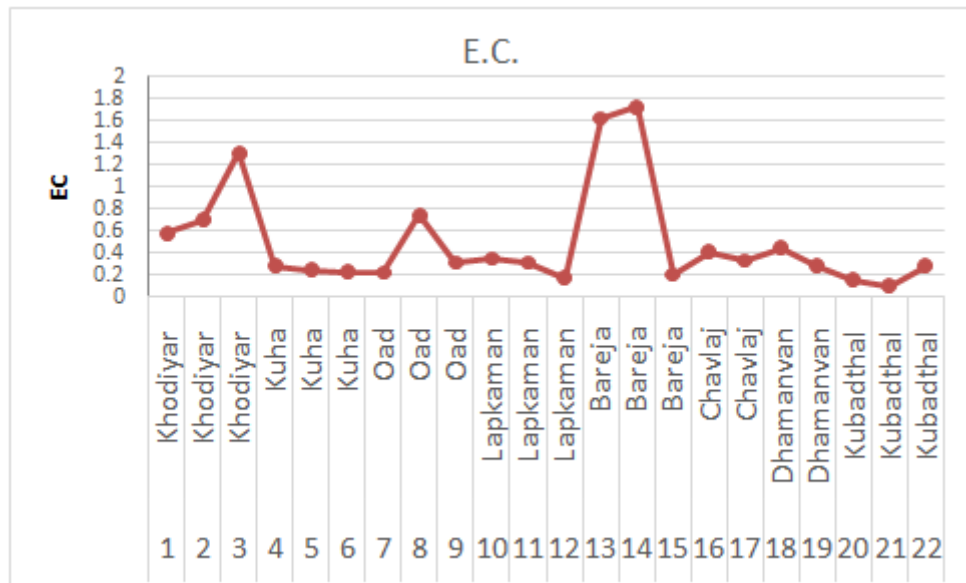
4. Tools And Techniques:

Mean, minimum and maximum are calculated for measured soil parameters. We have derived and analysed the all above mentioned samples data according to Government of Gujarat, Agriculture Department Soil Testing Laboratory Manual. Descriptive statistical analysis and Pearson’s correlation analysis are used to analyse soil samples data. Variables employed for analysis in this study include organic carbon (OC), phosphorus (P), potassium (K), electrical conductivity (EC) and pH.

Table 1: Soil parameters of selected samples from the sample sites

Sample No	Sample Site	pH	E.C.	OC (%)	P	K
1	Khodiyar	5.9	0.58	0.56	38	394
2	Khodiyar	7.3	0.7	0.58	41	192
3	Khodiyar	6.6	1.3	1.08	34	394
4	Kuha	7.3	0.28	0.69	41	338
5	Kuha	8	0.25	0.4	49	348
6	Kuha	6.9	0.23	0.39	39	411
7	Oad	6.7	0.22	0.96	28	230
8	Oad	7.9	0.74	1.29	53	333
9	Oad	6.2	0.31	0.99	55	460
10	Lapkaman	8	0.35	1.1	40	364
11	Lapkaman	7.6	0.31	0.56	72	382
12	Lapkaman	7.6	0.18	0.86	27	193
13	Bareja	6.3	1.62	0.53	38	159
14	Bareja	7.1	1.72	0.51	47	378
15	Bareja	6.7	0.2	0.44	40	412
16	Chavlaj	7.6	0.41	1.18	76	198
17	Chavlaj	7.7	0.33	0.96	95	351
18	Dhamanvan	7	0.45	0.79	37	265
19	Dhamanvan	8.2	0.28	1.19	40	414
20	Kubadthal	8.7	0.16	0.31	24	215
21	Kubadthal	7.7	0.1	1.62	48	559
22	Kubadthal	8.5	0.28	1.08	31	299
Mean		7.34	0.5	0.821	45.13	331.32
Min		5.9	0.1	0.31	24	159
Max		8.7	1.72	1.62	95	559





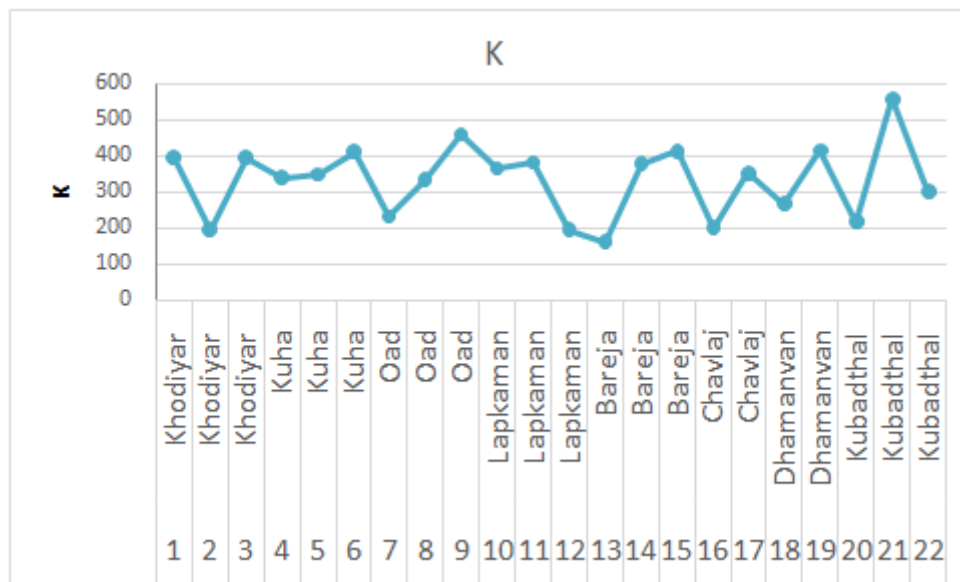


Figure: Charts of pH, P, EC, OC and K

Table 2: Interpretation of soil properties (Reference: MMSOIL-Gov. of India-2011)

Parameters	Interpretation	
pH	< 4.6	Extremely acidic
	4.6 – 5.5	Strongly acidic
	5.6 – 6.5	Moderately acidic
	6.6 – 6.9	Slightly acidic
	7	Neutral
	7.1 – 8.5	Moderately alkaline
	> 8.5	Strongly alkaline
EC dS/cm	0 – 2	Salt Free
	4 – 8	Slightly Saline
	8 – 15	Moderately Saline
	> 15	Highly Saline
OC (%)	< 0.5	Low
	0.5 – 0.75	Medium
	> 0.75	High
P Kg/ha	< 10.0	Low
	10 – 24.6	Medium
	> 24.6	High
K Kg/ha	< 108	Low
	108 – 280	Medium
	> 280	High

5. Results And Discussion:

The study of soil parameters and descriptive statistics are shown in table. Soil samples collected from different sites show pH range between 5.9 and 8.7 in chemical analysis. Soils are neutral to alkaline in reaction, pH varied from 5.9 to 8.7 with the mean value of 7.34.

According to Govt. manual presented in table-2, The obtaining pH value 5.9 - 8.7 indicates, three types of samples are acid, neutrals and alkaline.

The electrical conductivity value of soil samples are varied from 0.1 to 1.72 dS/cm with a mean value of 0.5 dS/cm. It shows all samples are salt free (table 2).

Organic carbon (OC) of the soil samples are varied from 0.31 to 1.62 with a mean value of 0.82 given in table-1. It is very low is less than 0.50 in 18% soil samples, medium 0.50-0.75 in 27% soil samples and 55% samples are with high value is greater than 0.75.

Phosphorus level of studied samples are 24 to 95 kg/ha given in table-1. For phosphorous most of the 95% soil samples are fall in high range is greater than 24.6, one sample is in medium range and no one is in lower range. From these of Phosphorus level indicate that a lot of fertilisers practice in those fields.

There are no any samples in low range of potassium, either they are in medium or in high range. Among 22 samples, 32% lies in medium amount between the ranges of 108 to 280, whereas remaining 68% are with very high amount is greater than 280, may be due to excess use of fertilizers.

6. Conclusion:

After the study of soil samples following conclusions can be made for the medium black as well as goradu (sandy loam) soil of Daskroi taluka Ahmedabad district in Gujarat state.

1. Analysis shows positive significant correlation of pH with available macronutrients organic carbon and potassium.
2. Electrical conductivity has positive but not significant correlation with organic carbon, and potassium, while it has poor negative correlation with phosphorus.
3. Organic carbon has high degree of positive correlation with potassium.

7. Acknowledgement:

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