

## **Original Research Paper**

Chemistry

# Soil Acidity and Alkalinity Study of Daskroi Taluka, Ahmedabad, Gujarat

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ABSTRACT This paper presents the influence of pH on soil fertility and productivity. The prime aim of this study is to determine acidity, alkalinity, neutrality of soil through measurement of pH of Daskroi taluka, Dist. Ahmedabad. Soil sodicity and productivity is depends on various parameter like morphology, physico- chemical parameters and biological constitute. This study is particular focus on pH and fertility status characteristics of soil samples. Sample was analyzed from Daskroi taluka Dist Ahmedabad because this area closes to industrial activity. The result revealed that pH ranged between 5.2 to 9.0. Main objective of this soil analysis is to examine soil pH as per Government of Gujarat Agriculture department lab manual under soil health card project.

## KEYWORDS : pH, soil fertility, soil acidity, soil alkalinity, Soil analysis, Daskroi

## 1. Introduction:

India is largely depending on agriculture. There are huge scopes in agriculture sector. In Present scenario It is required to accelerate Agriculture productivity. Higher agriculture productivity is only achieved when farmer managed agriculture in scientific way and It is also necessary to know all factor which useful to boost agriculture productivity. There are numerous factors which involved in agriculture productivity in which Soil play key role in agriculture production .So for that we think about soil health, soil nutrient, soil properties and various soil parameter that decide soil fertility and productivity. There are different parameters which define soil productivity. In all these parameter acidity and alkalinity of soil is also valuable. Soil acidity and alkalinity can be determined by pH value. The pH value of soil sample is taken into consideration due to chemical characterization of soil. The pH range is indicating whether soil is acidic, basic or neutral. Soil acidity is increase due to mineral leaching, decomposition of acidic plant, industrial wastes, and acid rains due to microbiological activity. Soil basicity is increase due to high proportion of sodium potassium, magnesium and calcium.

Present study is an attempt to determine acidity and alkalinity of soil of Daskroi taluka Ahmedabad, Gujarat. This study helps farmers to decide the amount and the type of fertilizer to be added to soil to make the more fertile. In sort the objective of this paper was to analyse the trend in acidity and alkalinity status of soils of Daskroi taluka of Gujarat State.

In this work, analysis is used to study 60 random, medium black and goradu(sandy loam) soil samples collected from different farm sites of Daskroi taluka villages.

#### 2. The Study Area:

In Gujarat state Ahmedabad is the central district in western India. It has total ten talukas. One of them is Daskroi taluka has 71 villages, covering an area of 656 sq.kms. The latitude and longitude are 23°.006 North (latitude) and 72°.6674 East (longitude) of Daskroi taluka respectively. The temperature range is between 45°C (max.) and 7°C (min.). In monsoon the



average rainfall is 756 mm.

It consists three types of soils, there are medium black, goradu(sandy) and hydromorphic. Different grains, cotton and different horticulture are the crops which are cultivated in this area. From the collected samples the analysis has done at Science College under the soil health card program by Government of Gujarat, India. In this work, taken 20 village soil sample randomly.

#### 3. Soil Sampling And Analysis:

The samples were collected as per norms of soil testing laboratory at 0 to 20 cm depth below the surface. The samples were required to dry and passed through a 2 mm size sieve to prepare them for testing in laboratory. According to "Methods Manual-Soil Testing in India" all the samples were tested in the laboratory. The samples were analyzed for acidity and alkalinity on digital pH meter.

The pH values were determined using digital pH meter. According to soil testing laboratory manual method, 10 g soil sample was mixed with 20 ml distilled water in 1:2 ratios. The suspension was stirred constantly with glass rod about 30 minutes and left for one hour. The combine electrode was dipped into suspension and pH was measured. The pH values are a measure of the hydrogen ion concentration of the soil samples and determine the acidity and alkalinity of the soil. It is a useful property of soil as it determines the level of nutrients, microbial activity and physical condition of soil.

#### Table 1: Soil parameters of selected samples sites

Lab Sample No.	Sample site	рН	Lab Sample No.	Sample site	рН
373	Bhuval	8.4	504	Dhamanvas	7.2
413	Bhuval	8.7	700	Dhamanvas	7.4
283	Bhuval	8.4	569	Dhamanvas	8.0
39	Kashindra	8.7	105	Aslali	7.7
24	Kashindra	8.4	497	Aslali	7.5
546	Kashindra	8.5	934	Aslali	6.3
821	Hariniyav	5.2	8.1	Timba	8.1
248	Hariniyav	5.5	189	Timba	7.6
378	Hariniyav	5.3	247	Timba	7.4
642	Kunjad	9.0	31	Lalpur	8.2
685	Kunjad	8.9	2	Lalpur	8.1
116	Kunjad	8.6	163	Lalpur	7.9
860	Vasai	6.1	445	Kubadthal	8.2
310	Vasai	6.3	970	Kubadthal	8.1
847	Vasai	6.6	164	Kubadthal	7.6
289	Naj	7.8	304	Bhuvaladi	8.6
513	Naj	7.9	944	Bhuvaladi	8.4
246	Nai	8.0	891	Bhuvaladi	83

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454	Pasuj	7.2	74	Lilapur	7.7
327	Pasuj	7.8	75	Lilapur	7.6
318	Pasuj	7.1	86	Lilapur	8.0
194	Chavalaj	8.1	148	Zanu	7.9
366	Chavalaj	7.9	350	Zanu	8.0
12	Chavalaj	7.8	153	Zanu	7.4
21	Govindada	8.1	111	Bhal	8.3
102	Govindada	7.8	177	Bhal	8.2
70	Govindada	7.7	31	Bhal	8.1
86	Lapkaman	8.1	931	Undrel	8.2
420	Lapkaman	8.0	362/2	Undrel	8.3
290	Lapkaman	7.6	279	Undrel	7.4

Parameters	Interpretation	
	< 4.6	Extremely acidic
	4.6 – 5.5	Strongly acidic
	5.6 – 6.5	Moderately acidic
nH	6.6 – 6.9	Slightly acidic
	7	Neutral
	7.1 – 8.5	Moderately alkaline
	> 8.5	Strongly alkaline

### 5. Results And Discussion:

The soil acidity expressed in term of soil pH. The negative logarithm of hydrogen ion concentration in solution is known as pH. The pH range between 1 to 14 ranges is reveled different properties. Soil pH values below 7 suggest acidic soil, and above 7 express basic or alkaline soil. Soil pH is depending upon various factors such as temperature, soil composition, cation exchange processes and hydrolysis reactions associated with the various organic and inorganic soils constitutes. The buffer capacity of soil is also important in determination of pH. The pH value is influenced to growth of plant.

Following conclusions from this study can be made for the soil samples of Daskroi taluka Ahmedabad district in Gujarat state.

The ideal pH range is between 6.0 to 7.0 ranges. Generally soil has a pH range between 2.0 to 11.0, while soil with sulfuric material may have a pH below to 2.0

Analysis shows pH of samples fall between 5.2 to 9.0 range.

A pH less than 4 suggest the presence of free acid generally from oxide.

A  $\,$  pH less than 5.5 point out that occurrence of exchangeable Al to exchangeable H+ .

A pH from 7.3 to 8.5 indicate that presence of CaCO3

A pH greater than 8.5 indicates that the significant amount of exchangeable presence of sodium carbonate. Where the pH is lower than criteria, then it is advisable to farmer for enhancement of pH add lime stone in their field. The amount of lime stone to be added is depending on the amount of organic matter and clay content of soil.

A soil PH is more than about 8.0 is due to high content of calcareous rock (calcium carbonate) generally acid treatment available but it is uneconomical for soil .Therefore it is advisable to farmer to apply phosphorus, iron , copper and zinc to soil because such element are less available to plants in calcareous soil.

Highest pH recorded is 9.0 at L.S.No 642 at Kunjad viilage site.

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