



**STUDY ON SOIL PHYSICO-CHEMICAL AND NUTRIENTS  
CHARACTERISTICS ASSESSMENT IN ZATAMZIRI VILLAGE OF  
WARUD TAHASIL, AMRAVATI DISTRICT(M.S.)**

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**ABSTRACT**

An attempt was made to analyse the physical and chemical factors of Five soil samples in Zatomziri Village In Warud Tahasil belongs to Amravati district in Maharashtra, India was selected for the present investigation. The soil parameters like soil moisture, pH, EC, Carbon, Calcium carbonate, Magnesium, Calcium, TDS, Nitrogen, Potassium and Phosphorous content, heavy metal like Fe were analyzed in the month of February 2014, it was found that there was a marked variation in nutrients and parameters of various sample point in different farmers field.

**KEYWORDS:** Soil testing, Parameters, Zatomziri Village, Nutrients.

**INTRODUCTION**

Soil is an important indispensable storehouse of water, air and nutrients that are essential for plant growth. For optimum plant growth the available nutrient elements and water must available in adequate amounts and suitable proportion, a term that is widely referred to as "soil fertility". To evaluate the soil fertility status of soil, there is a need to determine its physical, chemical and biological characteristics. No two soils are the same even if they are in the same general classification. The composition of the soil will vary depending on physical and chemical factors which vary due to location.

The effects of sewage water and canal water irrigation were compared by their physicochemical properties and heavy metals concentration in soil.<sup>[1]</sup> Banerjee studied

Agricultural soil contains phosphates in variable amounts depending on microbial count, amount of organic materials, other macroscopic living organisms and their activities etc. collected from the various agricultural lands, of the district Burdwan, West Bengal, India.<sup>[2]</sup> Wasim Iftikar study outlines a cost effective option of implementing improved nutrient management in large tracts of small-scale farming systems in Asia.<sup>[3]</sup> M.G. Sanal Kumar studied assesses the floral diversity of Konni Forest Division and its distribution in relation to various edaphic factors.<sup>[4]</sup> Physico-chemical parameters and elemental analysis of the soils of sunflower growing field reported by S. Velmurugan.<sup>[5]</sup> Physicochemical Properties of Soil Samples in Ahmednagar Industrial Area, work for the study of Impact of chemical industries on soil quality.<sup>[6]</sup> Physicochemical Analysis have been done of Soils from Eastern Part of Pune City.<sup>[7]</sup> The study focuses on analysis of physico chemical parameters of soil in a protected forest ecosystem of Askot Wild Life Sanctuary in the district of Pithoragarh, Uttarakhand, India.<sup>[8]</sup> Physico-Chemical characteristics Assessment of the Soil of Nagchoon Pond Khandwa, MP, India.<sup>[9]</sup>

Soils under three different vegetation types- the forest, the savanna and swamp forest within the forest zone in the coastal area of Badagry were analysed and compared <sup>10</sup>. In the study area of Masal forests of Iran Effect of physico-chemical characteristics of soil on growth and wood production in Cottonwood Plantation.<sup>[11]</sup> Considerable research work has been done regarding the study of nutrients from various types of soil in Maharashtra as well as in India<sup>[12-14]</sup> but the investigation of nutrients and parameters of Soil of Zatamziri village in Warud Taluka of Amravati district in Maharashtra, India was still lacking.

## **MATERIALS AND METHODS**

### ***A. AREA FOR WORK***

Zatamziri is a small village in Warud Tahsil, of Amravati District (Maharashtra State). This area is well known for Oranges, Cotton and Chilis. The sources of water for this area is of well and tube well. It is located at bottom of Satpuda ranges. Relative to its geographical location, the study area enjoys a tropical type of climate.

### ***B. Sample Collection***

Five samples were collected from the study area (farmers field). In the month of February 2014. Soil samples were collected randomly at 0 to 15 cm and 15 to 30 cm depths with five plots, five samples from each plot, respectively. In well sterilise polythene pouches.

Soil sample were collected from following Farmers fields,

1. Sample 1(SDG-1) was collected from Mr.Suresh S. Supale's field.
2. Sample 2 (SDG-2) was collected from Mr.Dnyanehvar V. Suple's field.
3. Sample 3(SDG-3) was collected from Mr.Bhashkar M. Thakare's field.
4. Sample 4 (SDG-4) was collected from Mr.Gajanan R. Gorde'sfield.
5. Sample 5 (SDG-5) was collected from Mr.Ramesh D. Nimkar's field.

### C. Physicochemical Analysis of Soil Samples

Reagents uses for this research work were AR grade and chemicals other than reagent are LR grade manufactured by S.D. fine, LOBA and Merck. The soil sample were dried for about 24 hr. and grinded more finely.

Methods use for estimation of various parameters are

**Table-1**

Sr. No.	Nutrients/Parameters	Method
1	Moisture	By weighing
2	pH	Digital pH meter
3	Electric Conductance	Conductometer
4	Organic Carbon	Titration method
5	Calcium (Ca)	Titration Method
6	Nitrogen(N)	Titration method
7	Phosphorous (P)	Titration method
8	Potassium(K)	Flame photometry
9	Calcium Carbonate (CaCO <sub>3</sub> )	Titration Method
10	Colour	By viewing
11	Copper (Cu)	Spectrophotometry
12	Zink (Zn)	Atomic absorption
13	Alkalinity	Titration method
14	Magnesium	EDTA Titration method

## RESULTS

**Table 2: Physico-Chemical and Nutrients Parameters of Soil Samples**

Sr. No.	Parameters	SDG-1	SDG-2	SDG-3	SDG-4	SDG-5
1	Colour	Medium Black	Brown	Sallow Black	Black	Deep Black
2	Moisture (%)	10	5	7.5	6	7
3	pH	8.1	8.4	7.6	7.5	7.3
4	Organic Carbon (%)	0.56	0.59	0.60	0.58	0.62
5	Nitrogen (kg/hect)	215	197	270	245	258
6	Phosphorous (kg/hect)	13	16.5	17.5	18	18
7	Potassium (kg/hect)	433	390	295	368	375
8	Copper (ppm)	7.77	4.66	6.21	8.28	5.15
9	Zinc (ppm)	0.89	0.84	2.17	2.5	3.32

10	Electro Conductance (ms)	0.53	0.44	0.45	0.40	0.58
11	Calcium (%)	1.026	0.705	0.961	0.980	0.705
12	Alkalinity(mg/L)	250	200	300	350	150
13	CaCo <sub>3</sub> (%)	4.38	4	5.25	4.30	6.25
14	Magnesium	0.11	0.12	0.15	0.01	0.03

## DISCUSSION

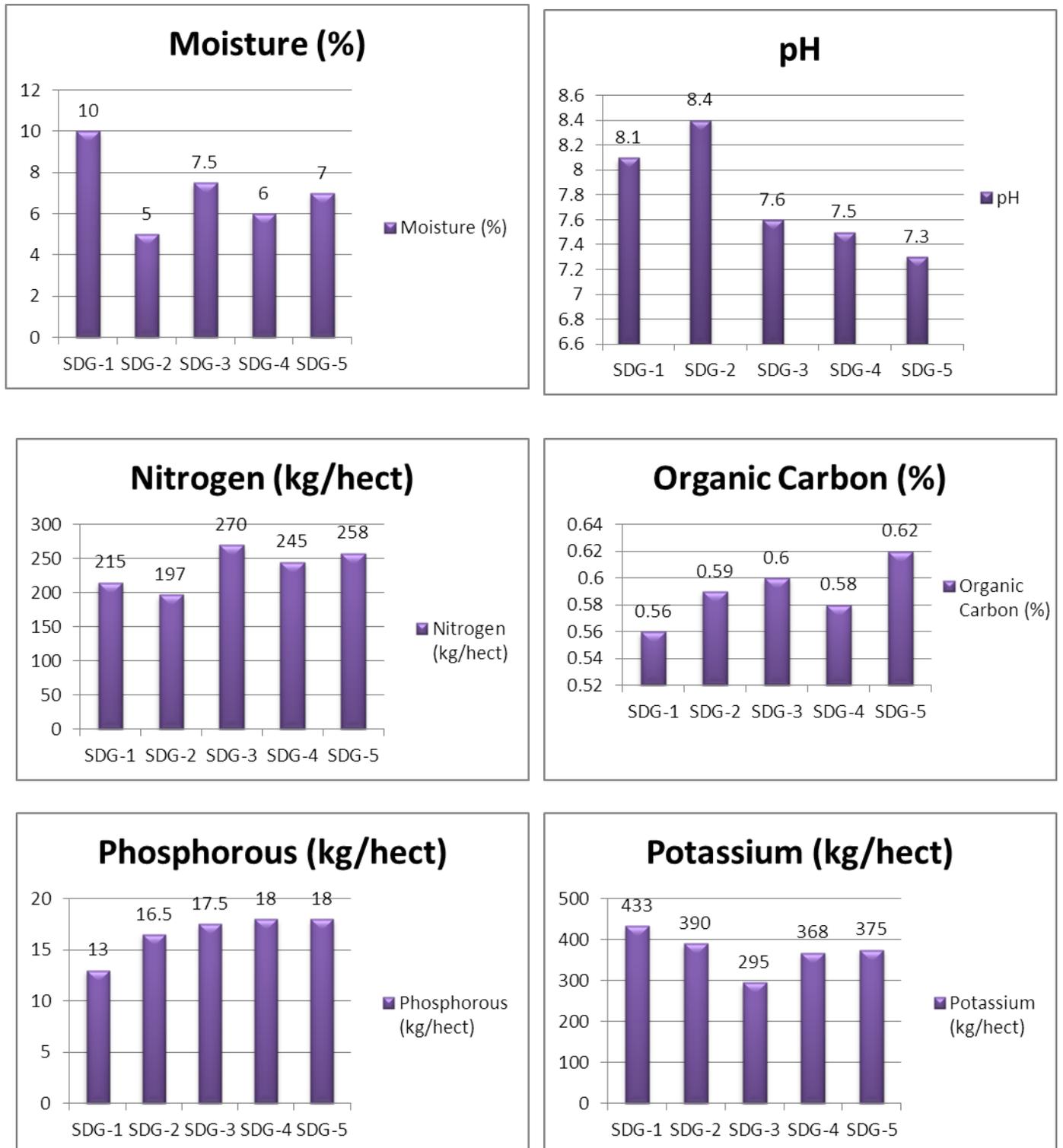
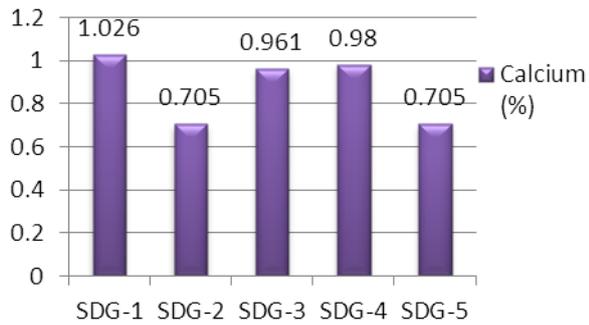
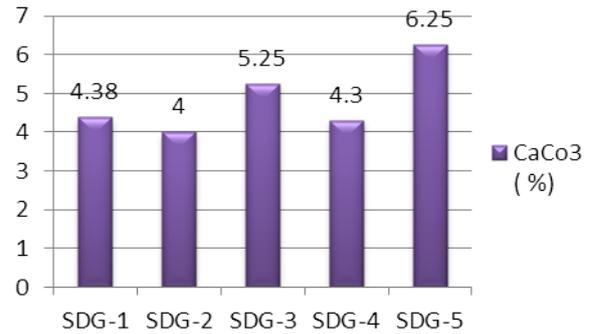
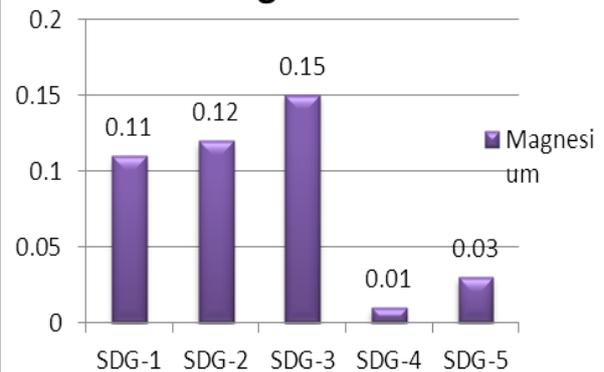
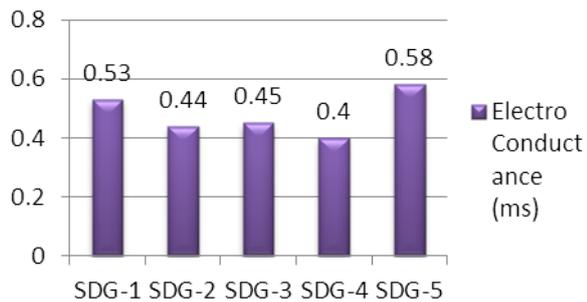
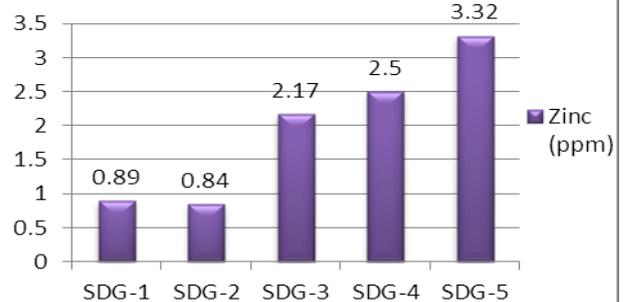
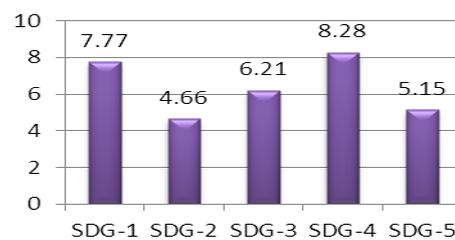


Fig. Showing analysis of soil samples with different parameters.

**Calcium (%)****CaCO<sub>3</sub> (%)****Alkalinity(mg/L)****Magnesium****Electro Conductance(ms)****Zinc (ppm)****Copper (ppm)**

**Colour of Soil**

The soil sample SDG-4 Black in colour, samples SDG-1, SDG-3, SDG-5 are Medium Black, Shallow Black and Deep Black in colour respectively,SDG-5 is Brown in colour.

**Moisture**

The moisture content value ranges from 5 % - 10 %. It is clear from the result that soil sample SDG-2 only 5 % moisture which is less as compared to sample SDG-1,SDG-3,SDG-4and SDG-5.

**pH**

pH was observe in the range 7.3 – 8.4. The Soil sample SDG-3, SDG-4, SDG-5 is very slightly alkaline sample and SDG-1,SDG-2, soil sample is medium alkaline.

**Organic Carbon**

Organic carbon values were recorded in the range of 0.56 – 0.62 %.The soil sample SDG-1 has less organic carbon, sample SDG-2, SDG-3, SDG-4 have moderate and sample SDG-5 has high percentage of organic carbon.

**Available Nitrogen**

Available nitrogen content in the soil sample ranged from 197- 270 kg/hect. The soil sample SDG-2 have less nitrogen content as compared to sample SDG-1, SDG-3, SDG-4, SDG-5.

**Phosphorous**

Phosphorous content in the soil sample ranged between 13- 18 kg/hect. The soil sample SDG-1 has less phosphorous content as compared to sample SDG-2,SDG-3 SDG-4 and SDG-5.

**Potassium**

Potassium content in the soil sample ranged between 295–433kg/hect. The soil sample SDG-3 have less potassium content as compared to sample SDG-1, SDG-2, SDG-4&SDG-5.

**Copper**

The Copper content in soil samples ranges from 5.15–7.77. It is seen that soil sample SDG-2, SDG-5 have less amount of Copper content as compared to sample SDG-1, SDG-3 & SDG-4.

**Magnesium**

The Magnesium content in the soil sample ranged from 0.84 – 3.32. It is seen that soil sample SDG-1, SDG-2 have less amount of magnesium as compared to sample SDG-3, SDG-4 and SDG-5.

**Electric Conductance**

The Electric Conductance values ranged from 0.40 – 0.58 $\mu$ S. It is seen that soil sample SDG-4 have less amount of Electric Conductance as compared to sample SDG-1,SDG-2,SDG-3& SDG-5

**Calcium**

The Calcium content in soil sample ranges from 0.705–1.026 %.It is seen that soil sample SDG-2 and SDG-5 have less amount of Calcium content as compared to sample SDG-1,SDG-3 &SDG-4.

**Alkalinity**

The Alkalinity was observed in the range between 150 – 300mg/l. It is seen that soil sample SDG-2 &SDG-5 has less alkalinity as compared to SDG-1, SDG-3 & SDG-4.

**Calcium Carbonate**

The Calcium Carbonate content in soil samples ranges from 4 - 6.25 %.It is seen that soil sample SDG-1, SDG-2 and SDG-4 have less amount of Calcium Carbonate as compared to soil samples SDG-3 and SDG-5.

**CONCLUSION**

The soil sample SDG-1 have pH is alkaline and goes on increasing. Use Gypsum before rainy season in per acre 125 kg mix in soil then the soil fertility increases for orange trees these things are more useful and also the water storing capacity of soil increases. Due to this, trees infertility is decreases.

In this soil the percentage of potash is very high but to crop of oranges 2% potash will be given by spraying and through soil, due to this the fruit become bright. The percentage of phosphorus in this soil is very low. Hence it is suggested to increase the percentage of phosphorus organic manures will be used, which increases the crop yield.

In the soil sample SDG- 4 the pH is low, percentage of compost manure, percentage of phosphorus is also low. So by using fertilizers and manures the percentage of above parameters can be managed.

In this soil inorganic manure percentage is poor. Due to this in soil per year 25-30 trucks compost manure is added. Due to this the percentage of Nitrogen increases and crop grows more.

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