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Comprehensive analysis of Soil samples From Dr. BAM University campus, Aurangabad, Maharashtra (India).

Potdar Vishnu¹, Awate Tanveer²

Assistant Professor, Department of Environmental Science, Deogiri College, Aurangabad, India¹

UG Student, Department of Electrical Engineering, Government College of Engineering, Aurangabad, India²

ABSTRACT: Soil provides various ecosystem services and support to human health. In soil quality analysis, soil macronutrient plays a very crucial role in the yield. The present research attempt was made to analyse the quality of soil in University campus of Aurangabad city in which soil organic carbon, soil organic matter, and Bulk Density was determined for which standard methods were used. Analysis of soil from particularly ten sampling locations were selected in order to estimate the quality of soil. It was observed that the average value of SOC was 1.60, 1.39 and 1.28 from rainy, winter and summer seasons respectively. SOM was 2.46, 2.76 and 2.50 from rainy, winter and summer seasons respectively. BD was 1.10, 1.144 and 1.141 from rainy, winter and summer seasons respectively. Numerous activities at sampling locations having numerous impacts on soil quality. Soil is the fundamental supportive component of life which provides food, clothing and shelter, so it is required to be protected and conserved.

KEYWORDS: Improvement, Agriculture, Ecosystem, Macronutrients, Carbon.

I.INTRODUCTION

Soil, water, and air these are the natural resources present on the earth planet. Human race depend on natural vegetation and natural resources such as land, soil as well as many resources for our survival. All these forms the basic components of our ecosystem. The soils native ability to supply sufficient nutrients has decreased with higher plant productivity levels (1). During green revolution period agriculture dependency was increased upon synthetic fertilizers which are output of fossil fuel. It has tremendously affected the soil, causing decrease in the organic carbon, reduction in microbial flora of soil, increasing acidity, alkalinity and hardening of the soil (3). The availability of nutrients is highly affected by pH of soil. Organic matter acts as buffering agent and after decomposing release organic acids and CO₂, which aids to dissolve the minerals in soil. Vegetation such as crops, plants which provides us food, energy and fibre to maintain the human health and habitation. Soil is the source for most of the essential nutrients required by crops(4) (6). The 13 mineral nutrients, which come from soils are generally dissolved in water and absorbed through roots. These nutrients are not always sufficient in the soil for plants to grow healthy. This is why many farmers and gardeners in the agriculture use fertilizers to add the nutrients to the soil The present world is highly dependent on the food production and the food production basically depends on the soil quality. So, knowledge about soil quality along with its components is the need of the time. Inversely hyperspectral non-imaging data is crucial in getting speedy, appropriate, less expensive, non-destructive diagnostic technique which can be provided a robust and most reliable approach to evaluate contradictory soil properties without the demand of chemicals(8) (9). Soil is composed of both organic and inorganic matter and it is essential for life on earth to exist. Soil analysis provides the solution to this problem of the farmers. Analysis is based on numerous physical and chemical parameters. Soil analysis can improve the crop fertility, productivity and control wastage of fertilizers. In Maharashtra state, large areas are under zinc deficiency followed by iron and manganese(4).

II.METHODOLOGY:

Aurangabad is one of fast growing, renowned industrial hub of Maharashtra. The district has geographical area of 10,107 sq.km, out of which 726 sq.km is occupied by forest while cultivated area is 8135.57 sq.km and net area sown is 6540 sq.km. The area is covered by the Deccan trap lava flows of upper cretaceous to lower Eocene age. This district is surrounded by Jalgaon district of North, Nashik district in west, Ahmednagar, and Beed district in south and Parbhani and Buldhana district in east. Aurangabad district has been divided in nine talukas viz. Aurangabad, Kannad, Soyagaon, Sillod, Phulambri, Khultabad, Vaijapur, Gangapur, and Paithan talukas. The climate of the Aurangabad district is generally characterized by a hot summer and a general dryness throughout the year except during the south west monsoon season, which is from June to September while October and November constitute the post-monsoon season. About 83% of annual rainfall is received during June to September. In the present today soil samples from areas namely S1 to S10 from Aurangabad city are collected and analysed. Generally soil pH is determined using glass electrode pH meter EC by conductivity bridge (5) as described by Piper available nitrogen by alkaline permanganate method and the potassium by flame photometer. pH, EC, Nitrogen, phosphorus, and potassium are supportive parameters in the organic carbon, Organic matter and bulk density of soil.

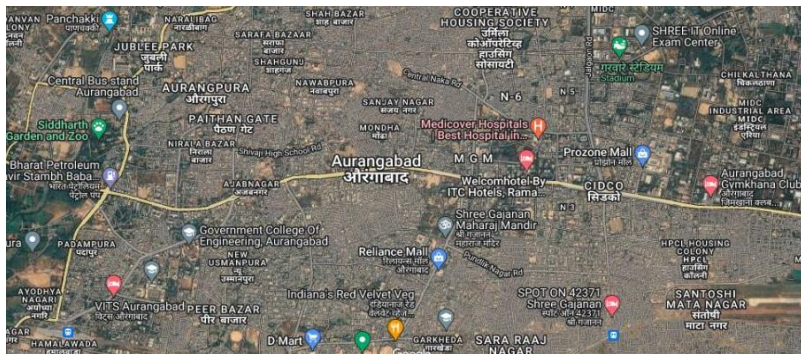


Fig1: Map showing location of Aurangabad city.

III. RESULTS AND DISCUSSIONS:

The systematic analysis of soil samples were carried to know Organic carbon, organic matter and bulk density of soil. The observed results have been tabulated in the table no. 1 and graphically represented. The analysis of soil provides the information about the soil samples at different sampling areas of Aurangabad. In the above graph Soil organic carbon percentage in Rainy season is 0.56%, in winter season is 1.75% and in summer season it is 1.45%. In the above graph Soil organic carbon percentage in Rainy season is 1.42%, in winter season is 1.45% and in summer season it is 1.52%. In the above graph Soil organic carbon percentage in Rainy season is 2.04%, in winter season is 2.09% and in summer season it is 2.23%.



Table 1: Analysis of Soil from Aurangabad university campus area

Study areas	Soil organic carbon (%)			Soil organic Matter (%)			Bulk density (g/cm3)		
	Rainy	Winter	Summer	Rainy	Winter	Summer	Rainy	Winter	Summer
S1	0.56	1.75	1.45	1.92	3.60	1.75	1.24	0.56	1.33
S2	1.42	1.45	1.52	1.78	3.42	1.94	1.62	0.85	0.78
S3	2.04	2.09	2.23	1.63	2.53	3.19	1.52	1.32	0.47
S4	2.15	2.03	0.63	1.72	1.96	3.42	1.58	0.96	0.88
S5	2.34	1.75	0.42	2.03	3.16	3.56	1.44	0.99	1.24
S6	1.41	1.53	0.89	2.45	3.12	2.78	0.49	1.05	1.61
S7	1.32	1.42	0.99	2.63	2.00	2.46	0.47	1.42	1.42
S8	1.42	0.63	1.56	3.14	1.99	2.13	0.52	1.61	1.35
S9	2.18	0.42	2.32	3.65	2.99	1.85	0.63	1.45	1.22
S10	1.19	0.85	0.88	3.71	2.89	1.97	1.54	1.23	1.11
Average	1.60	1.39	1.28	2.46	2.76	2.50	1.10	1.144	1.141
Maximum	2.34	2.09	2.32	3.71	3.6	3.56	1.62	1.61	1.61
Minimum	0.56	0.42	0.42	1.63	1.96	1.75	0.47	0.56	0.47

Soil organic carbon percentage in Rainy season is 2.15%, in winter season is 2.03% and in summer season it is 0.63%. In the above graph Soil organic carbon percentage in Rainy season is 2.34%, in winter season is 1.75% and in summer season it is 0.42%. In the above graph Soil organic carbon percentage in Rainy season is 1.41%, in winter season is 1.53% and in summer season it is 0.89%. In the above graph Soil organic carbon percentage in Rainy season is 1.32%, in winter season is 1.42% and in summer season it is 0.99%. In the above graph Soil organic carbon percentage in Rainy season is 1.42%, in winter season is 0.63% and in summer season it is 1.56%. In the above graph Soil organic carbon percentage in Rainy season is 2.18%, in winter season is 0.42% and in summer season it is 2.32%. In the above graph Soil organic carbon percentage in Rainy season is 1.19%, in winter season is 0.85% and in summer season it is 0.88%.

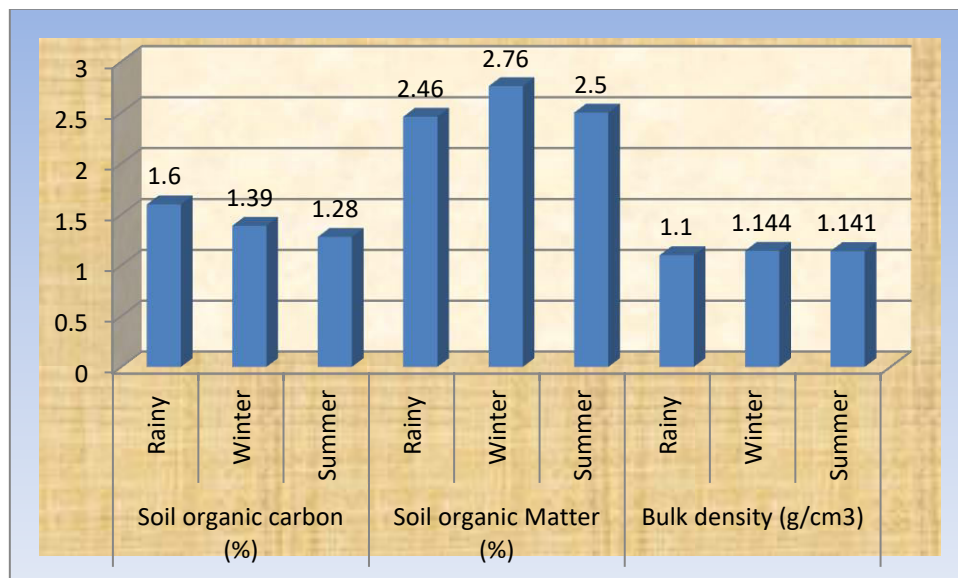


Fig1: Graph shows Soil organic carbon, soil organic matter and bulk density of the study area

IV. CONCLUSION

Soil is the most precious natural resource for floral occurrence. The quality and health of soil is very crucial for both agricultural sustainability and environmental quality. The organic matter content in any soil depicts the fertility of soil.

For the present analysis of research work standard methods were used for the estimation of soil organic carbon (SOC), organic matter (SOM) and bulk density (BD) of the soil. The average value of SOC was 1.60, 1.39 and 1.28 from rainy, winter and summer seasons respectively. SOM was 2.46, 2.76 and 2.50 from rainy, winter and summer seasons respectively. BD was 1.10, 1.144 and 1.141 from rainy, winter and summer seasons respectively. In the last few years, it has been a challenge to find the ultimate convenient technique for analysing soil characteristics and at the same time, decreasing the time and effort involved in field sampling and laboratory investigation. As the soil directly or maintain the nutrient balance in ecosystem, it is very crucial to maintain the health of the soil which can be done according to the estimated result of soil analysis.

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