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Assessment of Soil Quality from Mora, Uran, Navi Mumbai West Coast of India

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Abstract: *In order to establish anaerobic conditions in the upper part of the soil that promote the growth and regeneration of hydrophytes vegetation, coastal soils must be sufficiently wet, flooded, or ponded during the growing season. For coastal soils, the majority of the year is frequently rainy. Several physico-chemical factors, such as pH, alkalinity, calcium, carbonates, phosphates, nitrates, chloride, magnesium, and organic matter, were tested to assess the soil's quality.*

Keywords: West Coast, Soil, Physico-Chemical Properties, Land Filling.

I. INTRODUCTION

At the coast of Uran City, the Shewa Creek is shallow and narrow, but as it moves away from the city, it becomes wider and deeper. A range of habitats, including marshes, mudflats, the seashore, mangrove vegetation, and human habitations, may be found at the Mora site. Despite the comparatively modest amount of fresh water consumed, it is constantly being polluted by household waste and industrial effluents. The water also carries particles that are both organic and inorganic. The growth of mangroves is remarkable in the mudflats formed along creek banks. The coastal region of Uran was extremely stressed when CIDCO, a government agency, purchased the land. Throughout the past few decades, Uran's coastline region has seen considerable industrial growth. An important port known as Jawaharlal Nehru Port Trust (J.N.P.A.), Bharati Mumbai Container Terminal (PSA), Nhawa Sheva International Container Terminal (NSICT), and Gateway Terminal of India is located on the coast of Uran (GTI).

The hauling activities of the JNPA, PSA, NSICT, and GTI vessels result in the dumping of domestic and commercial waste as well as land filling for port-related purposes, making the coastal water dirty, greasy, and polluted. Changes in the environment, such as variations in the pH, the availability of nutrients, and the buildup of silt, have an impact on the distribution and richness of plant communities (Christensen and Crumpton 2010). Soil quality can be determined by evaluating the physical, chemical, and biological traits that have a substantial impact on agricultural productivity and sustainability. The complex system known as soil is made up of six distinct components, including inorganic elements, organic matter, soil organisms, soil moisture, soil solution, and soil air (Chandak Nisha et al 2017). Soil, the physical basis of ecosystems, is the primary medium for substance conversion and the biggest reservoir of chemical substances, which powerfully reflect the complex interactions in system evolution (Hamdan et al. 2010).

II. MATERIAL AND METHODS

Study area and methodology: Sheva Creek (Lat. 180 50' 20" N and Long. 720 57' 5" E) is marked by large mud flats with little mangrove growth and fewer stony areas.

The samples, which came to about 500gm in total, were obtained from topsoil down to a depth of 10 cm at three different locations. Before being dried by air, the samples were cleaned of trash such as plant roots and other detritus. 5 g of fresh sediments and 50 ml of distilled water were combined and agitated all night. The culture was centrifuged the following day, and the clear supernatant was used to calculate the pH, salinity, chlorinity, PO4-P, and NOx-N parameters using the instructions from Venkatachalam and Kale (2002). Sulphates were calculated using the Bower and Huss method (1948). CaCO3 Content, Organic Matter Applying Walkley and Black's Method (Allison and Moodie, 1965), (1935)

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III.RESULT AND DISCUSSION

Table:

Parameter / Site	Color	PH	Organic content g %	NOx-N g %	Po4-P g %	CaCo3 g %	Ca g %	CO3 g %	Chlorinity g %	Mg g %	Sulphate g %	Salinity
A	Black	7.4	0.0046	0.082	0.0114	41.26	2.46	18.12	31.46	1.44	0.0024	28.88
B	Black	7.1	0.0058	0.062	0.0154	38.46	3.18	30.44	36.62	0.98	0.0018	32.66
C	Black	7.2	0.0051	0.074	0.0122	40.14	2.66	27.02	32.14	1.82	0.0026	24.66

III. DISCUSSION

The quality of water is subject to significant variation depending on factors like the geochemistry of the soil it flows through, the amount of sewage dumped into it, the amount of water coming from its tributaries, the state of the climate, etc (Syamsundar et al.,2005). Acidity can grow in soil or water bodies as a result of sewage contamination, according to Kayden et al. (2015). We assessed the PH basic of the soil at all three sites, which is a sign of high-water quality. Flooding, subsurface water level, and precipitation all had a significant impact on the water table of surface soil, showing that hydrologic processes were very important in the pH heterogeneity of the soil. There was significant agreement between pH gradient variations. Luo and Xing (2010); Juutinen et al. (2001). The levels of organic matter content were much higher before the monsoon, whereas they were significantly lower after the rainfall. indicating that with enough precipitation before the monsoon, more humic acid is created, which is subsequently washed away during the monsoon (Gururaj and Nayak 2015). Studies show that the kind of vegetation has a substantial impact on soil organic matter content and nitrogen accumulations through changing the quantity of litter that falls to the ground, root growth, and soil microbial activity (Luo and Xing 2010; Zhang et al. 2010). Plant growth is more sluggish in coastal environments due to low nitrogen levels. The interior area has a higher concentration of nitrogen in surface soil than the coastal tract.

The study region has a larger percentage of phosphorus in the surface soil than the coastal tract, where the percentage of phosphorus concentration affects plant growth, despite the fact that the percentage of phosphorus in the surface soil of coastal sites has been determined to be relatively low. The relative higher Ca than Mg in the current study may be due to the higher percentage of acidic soil and soil. Because continuing agricultural operations may lose more Mg than Ca, Ca is more prevalent in the research region than the coastal tract. Cl, Na+, SO4 2, Ca2+, Mg2+, and "pH" classification data explain soil fertility characteristics. Organic materials, nitrogen, and magnesium make up the first three groups. The fifth category is acid-base properties, while the fourth category is salinity characteristics, which contains salt ions. pH is the fifth category. 2020 (Mingliang et al). For inorganic characteristics including CaCO3 concentration, chlorinity, salinity, and sulphate content, there is a general pattern of fall in the post-monsoon period. The seasonal change in the chlorinity and salinity samples from Site B was more pronounced than that from Site C.The coastal area has a lower sulphate level than interior locations that get runoff from land. Sulfur concentrations are more likely to be higher in mountains adjacent to coastlines with low heights and heavy rains (Bern et al., 2015).

IV. CONCLUSION

The physico-chemical properties that were investigated frequently shown variance at different region sample sites. These elements are essential for providing nourishment to the biotic ecosystem. Despite the status of the shore, if remedial measures are done, such as lowering sewage and solid waste at the source and regulating runoff-related silt, the ecosystem can be recovered. You can encourage the people to protect the mangroves and clear the water of floating trash.

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REFERENCES

[1] Bern, C.R., Chadwick, O.A., Kendall, C., Pribil, M.J. (2015) Steep spatial gradients of volcanic and marine sulfur in Hawaiian rainfall and ecosystems. Science of the Total Environment 514, 250-260.
[2] Chandak Nisha, Maiti Barnali Pathan Shabana, Desai Meena and Kamlesh Shah (2017) Newest International Referred Journals 4 Vol:3 Page: 36-40.
[3] Christensen, J.R., Crumpton, W.G. Wetland Invertebrate Community Responses to Varying Emergent Litter in a Prairie Pothole Emergent Marsh. Wetlands 30, 1031–1043 (2010). https://doi.org/10.1007/s13157-010-0109-8.
[4] Gururaj Vatsaraj and Pravin G. Nayak 2015 physico-chemical analysis of mangrove soil Proc UGC Sponsored National Seminar on "Wetlands-Present Status, Ecology & Conservation" ISBN: 978-81-925005-3-9 pp184-191.
[5] Hamdan MA, Asada T, Hassan FM, Warner BG, Douabul A, Al-Hilli MR, Alwan AA (2010) Vegetation Response to Re-flooding in the Mesopotamian Wetlands, Southern Iraq. Wetlands 30:177–188.
[6] Juutinen S, AlmJ,Martikainen P (2001) Effects of spring flood and water level draw-down on methane dynamics in the littoral zone of boreal lakes. Freshw Biol 46:855–869.
[7] Kayden Anthony, Kiran Kamble and Jyothi V.Mallia (2015) Study of soil parameters and biodiversity in ambernath taluka Proc UGC Sponsored National Seminar on "Wetlands-Present Status, Ecology & Conservation" ISBN : 978-81-925005-3-9 pp192-195.
[8] Luo XX, Xing ZQ (2010) Comparative study on characteristics and influencing factors of soil respiration of reed wetlands in Yellow River estuary and Liaohe River estuary. Procedia Environ Sci 2: 888–895.
[9] Mingliang Jiang, Ligang Xu, Xiaobing Chen Hua Zhu and Hongxiang Fan (2020) Soil Quality Assessment Based on a Minimum Data Set: A Case Study of a County in the Typical River Delta Wetlands, Sustainability 2020, 12, 9033; doi:10.3390/su12219033 www.mdpi.com/journal/sustainability.
[10] Shyamsundar, P. Araral, E., &Weeraratne, S. (2005). Devolution of Resource Rights, Poverty, and Natural Resource Management: A Review, Environment Department Paper, No. 104. The World Bank, Washington, D.C.
[11] Venkatachalam S. and Kale, P. G. (2002), "Benthic Macrofauna of Thane Creek: Seasonal Variations". Proceedings of National Seminar on Creeks, Estuaries and Mangroves, Pollution and Conservation, pp 78- 84.
[12] Yogita Kulkarni, Dr. Krishna K. Warhade, Dr. SusheelKumarBahekar (2014) Primary Nutrients Determination in the Soil Using UV Spectroscopy, International Journal of Emerging Engineering Research and Technology.
[13] Zhang CB,Wang J, LiuWL, Zhu SX, Liu D, Chang SX, Chang JB, Ge Y (2010) Effects of plant diversity on nutrient retention and enzyme activities in a full-scale constructed wetland. Bioresour Technol 101: 1686–1692.