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# Assessment of physio-chemical characteristic of soil and water collected from various location of Shankargarh and Jasra block of Prayagraj district

**Saumya, Amreen Hasan, Tarence Thomas and Anurag Singh**

**Abstract**
The Field experiment was conducted by during the year in the month August / October in different sites of Shankargarh and Jasra Block of Prayagraj, Uttar Pradesh. The present investigation "Assessment of Physio-chemical Characteristics of soil and water collected from various locations from Shankargarh, Jasra, block of Prayagraj district Results revealed that bulk density (1.306mg$^{-3}$), Particle density (2.321mg$^{-3}$), Pore space (49.24%), WHC (45.76%), pH (1.306), EC (0.355dsm$^{-1}$) Organic Carbon (0.608%) Nitrogen (325.68kg/ha), phosphorus (24.57kg/ha), Potassium (325.79kg/ha) was found maximum at the sight of SHUATS, research farm Logra. In terms of EC (0.94dsm$^{-1}$), chloride (81.33mg/l), Hardness of water (377.27), Potassium of water 27.36 mg/l was found maximum at the sight of NTPC Logra. With the information of famers can define the quantity of fertilizers that should be applied to improve the soil conditions. Integrated nutrient management can be adopted for sustainable soil Fertility Management as well as to achieve higher crop production.

**Keywords:** Different sites, physio-chemical properties, SHUATS, Logra Shankargarh, Jasra block

## Introduction
Pollution is one of the most challenging problems of today's era. It draws major public attention and is the result of industrialization, modernization and technological advancement in all fields of life in the global world. Air, Water, Soil, all have been adversely affected due to pollution. Unorganized, indiscriminate and unscientific dumping of wastes is very common disposal method in the Indian cities which cause adverse impacts to the environment. Sewage and domestic waste materials from different sources end up at dumpsites and due to the heterogeneity and complexity of wastes, these dumpsites contain a variety of contaminants which pollute the soil of the area.

Water is the precious gift of nature to the human being. It is essential for the growth and maintenance of our bodies; it is involved in a number of biological processes. The quality of irrigation water is a crucial factor for long term soil productivity. Use of Poor-quality water for a long time can make the soil less productive or even barren depending on the amount and type of constituents present in canal water. Many areas in the country are facing a serious problem of not only scarcity of water, but also of its poor quality.

Chemical composition is the most invoked factor in characterizing water quality. Biological, physical, and radiological factors are also considered when discussing water quality. Chemical Quality in major part of the district is fresh and suitable both for irrigation and for domestic purposes.

Prayagraj water is polluted by various kinds of natural wastes, domestic wastes and agricultural wastes and other factors creating water pollution problem particularly in fresh water system. In order to improve the production of crops, it is necessary to improve the quality of irrigation water. Use of poor-quality canal water deteriorates soil properties (Chaudhry *et al.*, 2014) resulting in crop yield loss [Akhtar *et al.*, 2016].

The greatest interest in soil is centered on it human sustainability. People consider soil important because it supports plants that supply food, fibers, drugs, and other enhances the plant productivity and also improve the quality of soil, water and air. If we do not improve the productive capacity of our delicate soils, we cannot continue to support the food and fiber urging of our ever-growing population (Choudhury, 2011. Singer and Ewing (2000) stated that "useful evaluation of soil quality is a required agreement about why soil quality is important, how it is defined, how it should be measured, and how to respond to measurements with management, restoration, or conservation practices". Determining soil quality requires one or more value judgments and because there is still much unknown about soil which may have direct bearing on the crop production level.

Some of the physical (soil texture, bulk density, particle density, porosity, rooting depth, colour, hydraulic conductivity, infiltration rate, water holding capacity, soil water retention curve and water stable aggregate, etc.), chemical (pH, EC, SOC, CaCO3, exchangeable cations and anions, CEC, ESP, SAR, macro and micro nutrients) and biological (soil microbial biomass, soil dehydrogenase and phosphatase enzyme activity) parameters which control the soil quality (Lal, 2004). Soil test-based fertility management is an effective tool for increasing productivity of agricultural soils that have a high degree of spatial variability resulting from the combined effects of physical, chemical or biological processes (Govaerts, 2008).

**Materials and Methods**

The present investigation "Assessment of Physio-chemical Characteristic of Soil and water Collected from Various Location of Shankargarh and Jasra Block of Prayagraj District" was carried out in agro- climatic condition of Prayagraj.

**Result and Discussion**

With respect to depth the max. Bulk density (Mg $m^{-3}$) was observed at Site $S_4$ (1.306 Mg $m^{-3}$) and min. was observed at Site $S_5$ (1.188 Mg $m^{-3}$) at 0-15 cm depth. At 15-30 cm depth the max. Bulk density (Mg $m^{-3}$) was observed at Site $S_4$ (1.312 (Mg $m^{-3}$) and min. was observed at Site $S_5$ (1.192 Mg $m^{-3}$).

With respect to Site the max. Bulk density (Mg $m^{-3}$) was observed at Site $S_4$ (1.306 Mg $m^{-3}$) (1.312 Mg $m^{-3}$) at 0-15 and 15-30 cm. And min. was observed at Site $S_5$ (1.188 Mg $m^{-3}$) (1.192 Mg $m^{-3}$) at 0-15 and 15-30cm. The increase in Organic Matter which in turn decreases Bulk Density with increase in Compactness. With respect to depth as the depth increase Bulk Density increases. Similar results were reported by Mohd *et al.,* 2021 and Sujata *et al.*, 2020.

With respect to depth the max. Particle density (Mg $m^{-3}$) was observed at Site $S_4$ (2.321 Mg $m^{-3}$) and min. was observed at Site $S_5$ (2.154 Mg $m^{-3}$) at 0-15 cm depth. At 15-30 cm depth the max. Particle density (Mg $m^{-3}$) was observed at Site $S_4$ (2.329 Mg $m^{-3}$) and min. was observed at Site $S_5$ (2.165 Mg $m^{-3}$).

With respect to Site the max. Particle density (Mg $m^{-3}$) was observed at Site $S_4$ (2.321 Mg $m^{-3}$) (2.329 Mg $m^{-3}$) at 0-15 and 15-30 cm. And min. was observed at Site $S_5$ (2.154 Mg $m^{-3}$) (2.165 Mg $m^{-3}$) at 0-15 and 15-30 cm. Particle density is dependent on mineral composition of soil. With respect to depth as the depth increase Particle density increases. Similar results were reported by Mohd *et al.*, 2021 and Sujata *et al.*, 2020.

With respect to depth the max. Pore space (%) was observed at Site $S_4$ (49.24%) and min. was observed at Site $S_5$ (41.27%) at 0-15 cm depth. At 15-30 cm depth the max. Pore space (%) was observed at Site $S_4$ (47.65%) and min. was observed at Site $S_5$ (40.10%).

With respect to Site the max. Pore space (%) was observed at Site $S_4$ (49.24%) (47.65%) at 0-15 and 15-30 cm. And min. was observed at Site $S_5$ (41.27%) (40.10%) at 0-15 and 15-30 cm. The increase in Organic Matter which in turn decreases Pore space with increase in Compactness. With respect to depth as the depth increase Pore space increases. Similar results were reported by Mohd *et al.,* 2021 and Sujata *et al.*, 2020.

With respect to depth the max. Water holding capacity (%) was observed at Site $S_4$ (45.76%) and min. was observed at Site $S_5$ (37.56%) at 0-15 cm depth. At 15-30 cm depth the max. Water holding capacity (%) was observed at Site $S_4$ (44.48%) and min. was observed at Site $S_5$ (36.12%).

With respect to Site the max. Water holding capacity (%) was observed at Site $S_4$ (45.76%) (44.48%) at 0-15 and 15-30 cm. And min. was observed at Site $S_5$ (37.56%) (36.12%) at 0-15 and 15-30 cm. Water holding capacity depends on the %Sand, Silt and Clay content in Soil. Similar results were reported by Mohd *et al.,* 2021 and Sujata *et al.,* 2020. With respect to depth the max. pH was observed at Site $S_4$ (1.306) and min. was observed at Site $S_5$ (1.188) at 0-15 cm depth. At 15-30 cm depth the max. pH was observed at Site $S_4$ (1.312 and min. was observed at Site $S_5$ (1.192).

With respect to Site the max. pH was observed at Site $S_4$ (1.306) and min. was observed a $S_5$ (1.188) at 0-15 cm depth. At 15-30 cm depth the was observed at Site $S_4$ (1.312) and min. was observed at Site $S_5$ (1.192). With respect to depth, as the depth increase pH increases. This is due to the fact that with depth of soil is possibly due to leaching of soluble salts. Similar results were reported by Priyanka *et al.,* 2020, and Panhekar *et al.,* 2020

With respect to depth the max. Electrical Conductivity ($dSm^{-1}$) was observed at Site $S_4$ (0.355 $dSm^{-1}$) and min. was observed at Site $S_5$ (0.269 $dSm^{-1}$) at 0-15 cm depth. At 15-30 cm depth the max. Electrical Conductivity ($dSm^{-1}$) was observed at Site $S_4$ (0.331 $dSm^{-1}$) and min. was observed at Site $S_5$ (0.258 $dSm^{-1}$).

With respect to Site the max. Electrical Conductivity ($dSm^{-1}$) was observed at Site $S_4$ (0.355 $dSm^{-1}$), (0.331 $dSm^{-1}$) at 0-15 and 15-30 cm. And min. was observed at Site $S_5$ (0.269 $dSm^{-1}$), (0.258 $dSm^{-1}$) at 0-15 and 15-30 cm. With respect to depth as the depth increase EC decreases. Similar results were reported by Priyanka *et al.,* 2020, and Panhekar *et al.,* 2020.

With respect to depth the max. Organic Carbon (%) was observed at Site $S_4$ (0.608%) and min. was observed at Site $S_5$ (0.469%) at 0-15 cm depth. At 150 cm depth the max. Organic Carbon (%) was observed at Site $S_4$ (0.585%) and min. was observed at Site $S_5$ (0.43%).

With respect to Site the max. Organic Carbon (%) was observed at Site $S_4$ (0.608%), (0.585%) at 0-15 and 15-30 cm. And min. was observed at Site $S_5$ (0.469%), (0.453%) at 0-15 and 15-30 cm. With respect to depth as the depth increase Organic Carbon decreases. This can be attributed to the fact that due to addition of Organic Matter and Farm yard manure to the upper layers which possibly do not reach lower layers. Similar results were reported by Priyanka *et al.,* 2020, and Panhekar *et al.,* 2020.

With respect to depth the max. Available Phosphorus (kg $ha^{-1}$) was observed at Site $S_4$ (24.57 kg $ha^{-1}$) and min. was observed at Site $S_5$ (15.58 kg $ha^{-1}$) at 0-15 cm depth. At 15-30 cm depth the max. Available Phosphorus (kg $ha^{-1}$) was observed at Site $S_4$ (23.68 kg $ha^{-1}$) and min. was observed at Site $S_5$ (14.90 kg $ha^{-1}$).

With respect to Site the max. Available Phosphorus (kg $ha^{-1}$) was observed at Site $S_4$ (24.57 kg $ha^{-1}$), (23.68 kg $ha^{-1}$) at 0-15 and 15-30 cm. And min. was observed at Site $S_5$ (15.58 kg $ha^{-1}$), (14.90 kg $ha^{-1}$) at 0-15 and 15-30 cm. The max. Phosphorus was observed in upper horizons than lower horizons. Similar results were reported by Meena *et al.,* 2020 and Priyanka *et al.*, 2020.

With respect to depth the max. Available Potassium (kg $ha^{-1}$) was observed at Site $S_4$ (325.79 kg $ha^{-1}$) and min. was observed at Site $S_5$ (267.01 kg $ha^{-1}$) at 0-15 cm depth. At 15-30 cm depth the max. Available Potassium (kg $ha^{-1}$) was

observed at Site $S_4$ (320.57 kg $ha^{-1}$) and min. was observed at Site $S_5$ (265.26 kg $ha^{-1}$).

With respect to Site the max. Available Potassium (kg $ha^{-1}$) was observed at Site $S_4$ (325.79 kg $ha^{-1}$), (320.57 kg $ha^{-1}$) at 0-15 and 15-30 cm. And min. was observed at Site $S_5$ (267.01 kg $ha^{-1}$), (265.26 kg $ha^{-1}$) at 0-15 and 15-30 cm. Similar results were reported by Meena *et al.,* 2020 and Priyanka *et al.,* 2020.

Variation in pH of water sample from Shankargarh block and Jasra block, Prayagraj District, Uttar Pradesh. The variation in pH of water sample from Shankargarh block and Jasra block was found significant variation in pH of waterwas observed between 8.23 to 7.38. Among the Shankargarh and Jasra block maximum pH of water (8.23) was recorded at $S_9$: Goorpur Brick Factory and minimum pH of water (7.38) was recorded at $S_6$: Mann Kameshwar Mandi, Lalapur. The results were in accordance with Rahman *et al.,* 2021 and Kumar *et al.,* 2019 [27].

Variation in EC of water sample from Shankargarh and Jasra block, Prayagraj District, Uttar Pradesh. The variation in EC of water sample from Shankargarh and Jasra block was found significant.

The variation in EC of water was observed between 0.94 to 0.50. Among the Shankargarh and Jasra block maximum EC of water (0.94) was recorded at $S_1$: NTPC Logra and minimum EC of water0.50 was recorded at $S_6$: Mann Kameshwar Mandi, Lalapur. The results were in accordance with Rahman *et al.,* 2021 and Kumar *et al.,* 2019 [27].

Variation in TDS of water sample from Shankargarh and Jasra block, Prayagraj District, Uttar Pradesh. The variation in TDS of water sample from Shankargarh and Jasra block was found significant and critical difference at 5% was recorded 27.731.

The variation in TDS of water was observed between 367.17 to 237.09. Among the Shankargarh and Jasra block maximum TDS of water (367.17 mg/l) was recorded at $S_3$: Shankargarh block compound and minimum TDS of water237.09 was recorded at $S_2$:JP Cement Plant Logra. All the TDS values fall under the permissible limits preferred by BIS (IS 10500:2004). The results were in accordance with Rahman *et al.,* 2021 and Kumar *et al.,* 2019 [27]. Variation in turbidity of water sample from Shankargarh and Jasra block, Prayagraj District, Uttar Pradesh. The variation in turbidity of water sample from Shankargarh and Jasra block was found significant and critical difference at 5% was recorded 3.476.

The variation in turbidity of water was observed between 8.05 NTU to 4.80 NTU. Among the Shankargarh and Jasra block maximum turbidity of water (8.05 NTU) was recorded at $S_4$: SHUATS Research Farm Logra and minimum turbidity of water (4.80 NTU) was recorded at $S_6$: Mann Kameshwar Mandi, Lalapur. All the Turbidity values fall under the permissible limits preferred by BIS (IS 10500:2004). The results were in accordance with Rahman *et al.,* 2021 and Kumar *et al.,* 2019 [27].

Variation in chloride of water sample from Shankargarh and Jasra block, Prayagraj District, Uttar Pradesh. The variation in chloride of water sample from Shankargarh and Jasra block was found significant.

The variation in chloride of water was observed between 81.33 to 70.34. Among the Shankargarh and Jasra block maximum chloride of water (81.33 mg/l) was recorded at $S_1$: NTPC Logra and minimum chloride of water70.34 mg/l was recorded at $S_9$: Goorpur Brick Factory. All the chloride values fall under the permissible limits preferred by BIS (IS 10500:2004). The results were in accordance with Kumar *et al.,* 2019 [27] and Chalapati *et al.,* 2018.

Variation in Calcium hardness of water sample from Shankargarh and Jasra block, Prayagraj District, Uttar Pradesh and fig variation in Calcium hardness of water sample from Shansankargarh and Jasra block was found significant and critical difference at 5% was recorded 7.330.

The variation in Calcium hardness of water was observed between 169.64 to 156.19. Among the Shankargarh and Jasra block maximum Calcium hardness of water (169.64 mg/l) was recorded at $S_6$: Mann Kameshwar Mandi, Lalapurand minimum Calcium hardness of water (156.19 mg/l) was recorded at $S_1$: NTPC Logra. All the calcium values fall under the permissible limits preferred by BIS (IS 10500:2004). The results were in accordance with Kumar *et al.,* 2019 [27] and Chalapati *et al.,* 2018.

Variation in total hardness of water sample from Shankargarh and Jasra block, Prayagraj District, Uttar Pradesh. The variation in total hardness of water sample from Shankargarh and Jasra block was found significant.

The variation in total hardness of water was observed between 377.27 to 312.38. Among the Shankargarh and Jasra block maximum total hardnessof water (377.27) was recorded at $S_1$: NTPC Logra and minimum total hardness of water (312.38) was recorded at $S_7$: Both Teerth Sthan, Deehaa. All the Total hardness values fall under the permissible limits preferred by BIS (IS 10500:2004). The results were in accordance with Kumar *et al.,* 2019 [27] and Chalapati *et al.,* 2018.

The variation in magnesium of water was observed between 221.80 to 206.53. Among the Shankargarh and Jasra block maximum magnesium of water (221.80 mg/l) was recorded at $S_{10}$: Goorpur glass factory and minimum magnesium of water (206.53 mg/l) was recorded at $S_7$: Both Teerth Sthan, Deehaa. All the magnesium values fall under the permissible limits preferred by BIS (IS 10500:2004). The results were in accordance with Kumar *et al.,* 2019 [27] and Chalapati *et al.,* 2018.

Variation in Potassium of water sample from Shankargarh and Jasra block, Prayagraj District, Uttar Pradesh. The variation in Potassium of water sample from Shankargarh and Jasra block was found significant.

The variation in Potassium of water was observed between 27.36 to 19.69. Among the Shankargarh and Jasra block maximum Potassium of water (27.36 mg/l) was recorded at $S_1$: NTPC Logra and minimum Potassium of water (19.69 mg/l) was recorded at $S_8$:Jasra Primary Health Care Centre. All the potassium values fall under the permissible limits preferred by BIS (IS 10500:2004). The results were in accordance with Praveen *et al.,* 2017 and Singh *et al.,* 2016.

Variation in sodium of water sample from Shankargarh and Jasra block, Prayagraj District, Uttar Pradesh. The variation in sodium of water sample from Shankargarh block and Jasra block was found significant.

The variation in sodium of water was observed between 24.36 to 14.58. Among the Shankargarh and Jasra block maximum sodium of water (24.36) was recorded at $S_{10}$: Goorpur glass factory and minimum sodium of water (14.58) was recorded at $S_4$: SHUATS Research Farm Logra. All the sodium values fall under the permissible limits preferred by BIS (IS 10500:2004). The results were in accordance with Praveen *et al.,* 2017 and Singh *et al.,* 2016.

The variation in nitrate of water sample from Shankargarh and Jasra block was found significant and critical difference at 5% was recorded 6.878.

The variation in nitrate of water was observed between 45.20 to 27.31. Among the Shankargarh block and Jasra block maximum nitrate of water (45.20) was recorded at $S_9$:Goorpur brick factory and minimum nitrate of water (27.31) was recorded at $S_6$:Mann Kameshwar Mandi, Lalapur. All the nitrate values fall under the permissible limits preferred by BIS (IS 10500:2004). The results were in accordance with Praveen *et al.,* 2017 and Singh *et al.,* 2016.

The variation in sulphate of water sample from Shankargarh and Jasra block was found significant.

The variation in sulphate of water was observed between 189.75 to 134.21. Among the Shankargarh and Jasra block maximum sulphate of water (189.75) was recorded at $S_1$: NTPC Logra and minimum sulphate of water (134.21) was recorded at $S_7$:Both Teerth Sthan, Deehaa. All the Sulphate values fall under the permissible limits preferred by BIS (IS 10500:2004). The results were in accordance with Praveen *et al.,* 2017 and Singh *et al.,* 2016.

**Table 1:** Bulk density, particle density, pore space, water holding capacity (WHC), pH and Electrical Conductivity (E.C.), organic carbon (O.C.), available NPK of soil

| Block | Site no. | Bulk density | Particle Density | Pore space | WHC | pH | EC | O.C. | N | P | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Shankargarh | $S_1$ | 1.287 | 2.216 | 47.01 | 43.23 | 7.19 | 0.311 | 0.48 | 287.03 | 18.31 | 283.28 |
| | $S_2$ | 1.265 | 2.190 | 44.50 | 40.06 | 7.08 | 0.303 | 0.50 | 290.46 | 17.84 | 277.52 |
| | $S_3$ | 1.276 | 2.203 | 45.29 | 43.27 | 7.15 | 0.269 | 0.52 | 276.92 | 19.32 | 268.98 |
| | $S_4$ | 1.309 | 2.325 | 48.44 | 45.12 | 7.06 | 0.343 | 0.59 | 322.90 | 24.12 | 323.18 |
| | $S_5$ | 1.19 | 2.159 | 40.68 | 36.84 | 7.68 | 0.263 | 0.46 | 259.97 | 15.24 | 266.13 |
| Jasra | $S_6$ | 1.194 | 2.219 | 43.55 | 40.00 | 7.28 | 0.275 | 0.52 | 275.22 | 17.03 | 316.23 |
| | $S_7$ | 1.221 | 2.229 | 42.32 | 38.89 | 8.17 | 0.335 | 0.48 | 268.18 | 20.39 | 308.19 |
| | $S_8$ | 1.243 | 2.198 | 44.45 | 39.95 | 8.12 | 0.316 | 0.53 | 264.28 | 21.45 | 311.73 |
| | $S_9$ | 1.251 | 2.257 | 47.28 | 43.91 | 8.19 | 0.287 | 0.52 | 273.13 | 22.17 | 288.47 |
| | $S_{10}$ | 1.225 | 2.288 | 41.32 | 37.77 | 8.39 | 0.322 | 0.55 | 269.85 | 19.17 | 292.18 |
| | F-Test | S | S | S | S | S | S | S | S | S | S |
| | S.Em+ | 1.12 | NA | 0.75 | 0.10 | 0.25 | 0.35 | 0.85 | 1.05 | 0.63 | 0.57 |
| | C.D. at 5% | 2.05 | NA | 1.21 | 0.50 | 0.85 | 1.05 | 2.40 | 2.15 | 1.10 | 1.09 |

**Table 2:** pH, EC, TDS, Turbidity, Chloride, Calcium hardness, Total Hardness, Magnesium, Potassium and Sodium of sample of water collected

| Block | Site no. | pH | EC | TDS (mg/l) | Turbidity (NTU) | Chloride | Calcium hardness | Total hardness (mg/l) | Magnesium (mg/l) | K | Na |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Shankargarh | $S_1$ | 7.55 | 0.94 | 238.42 | 8.05 | 81.33 | 156.19 | 377.27 | 214.04 | 27.36 | 16.65 |
| | $S_2$ | 7.60 | 0.90 | 237.09 | 5.94 | 70.79 | 160.22 | 355.01 | 214.08 | 24.76 | 15.31 |
| | $S_3$ | 7.94 | 0.67 | 367.17 | 4.98 | 77.06 | 163.75 | 347.78 | 217.85 | 25.27 | 15.40 |
| | $S_4$ | 8.05 | 0.79 | 307.28 | 4.80 | 77.18 | 162.53 | 347.86 | 212.29 | 25.29 | 14.58 |
| | $S_5$ | 7.98 | 0.70 | 299.98 | 4.22 | 71.98 | 162.99 | 350.85 | 207.94 | 25.34 | 15.31 |
| Jasra | $S_6$ | 7.38 | 0.50 | 297.62 | 5.01 | 74.79 | 169.64 | 330.67 | 210.31 | 20.14 | 21.88 |
| | $S_7$ | 7.64 | 0.61 | 286.61 | 5.00 | 72.28 | 169.37 | 312.38 | 206.53 | 23.98 | 21.51 |
| | $S_8$ | 8.15 | 0.68 | 319.15 | 4.89 | 75.82 | 168.07 | 319.77 | 209.39 | 19.69 | 22.64 |
| | $S_9$ | 8.23 | 0.78 | 243.42 | 6.05 | 70.34 | 163.78 | 329.30 | 220.85 | 19.86 | 22.90 |
| | $S_{10}$ | 8.18 | 0.71 | 310.39 | 5.83 | 75.17 | 166.09 | 326.97 | 221.80 | 21.49 | 24.36 |
| | F-Test | S | S | S | S | S | **S** | **S** | **S** | **S** | **S** |
| | S.Em+ | 0.532 | 0.213 | 1.673 | 3.476 | 1.188 | 2.614 | 1.527 | 1.542 | 3.903 | 2.908 |
| | C.D. at 5% | 0.263 | 0.105 | 0.731 | 1.714 | 0.466 | 0.330 | 0.293 | 0.183 | 1.924 | 1.434 |

## Conclusion

It was concluded that soil and water were collected from ten different sites of Shankargarh and Jasra Block of the Prayagraj has an appreciable soil health for farmers crop cultivation. From the above findings, Bulk Density (mg $m^{-3}$) was found maximum in site $S_4$ (1.306 mg $m^{-3}$) and in terms of Particle Density, Pore Space, Water Holding Capacity, pH Electrical Conductivity, Organic Carbon was found maximum in site $S_4$ (SHUATS Research Farm, Logra). In terms of depth of the soil, available Nitrogen (Kg. $ha^{-1}$), available Phosphorous (Kg. $ha^{-1}$) and available Potassium (Kg. $ha^{-1}$) was found maximum in site $S_4$ (SHUATS Research Farm, Logra). In terms of water, Electrical Conductivity, TDS, Turbidity, Chloride, Calcium Hardness, Magnesium, Potassium, Sodium, Nitrite, Sulphate of water was found maximum at Shankargarh and Jasra Block.

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