https://doi.org/10.17221/37/2024-SWR

# Assessment of soil salinity and environmental factors in the Kesem irrigation scheme, Afar Region, Ethiopia

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**Electronic Supplementary Material (ESM)**

The authors are fully responsible for both the content and the formal aspects of the electronic supplementary material. No editorial adjustments were made.

https://doi.org/10.17221/37/2024-SWR

Table S1. Summary of statistics for soluble cation and anion composition of soil samples ($n$ = 154)

| Soil variables and environmental factors | Unit | Min | Max | Mean | SD | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|
| **0–30 cm** | | | | | | | |
| pH | – | 7.10 | 9.40 | 8.21 | 0.44 | (0.26) | (0.03) |
| EC | dS/m | 0.24 | 10.12 | 1.60 | 1.49 | 1.96 | 6.17 |
| Sodium | mEq/L | 3.23 | 64.74 | 21.67 | 11.46 | 1.08 | 1.26 |
| Potassium | mEq/L | 0.12 | 52.10 | 6.43 | 8.09 | 3.47 | 14.92 |
| Calcium | mEq/L | 0.06 | 23.30 | 7.66 | 7.95 | 1.11 | (0.45) |
| Magnesium | mEq/L | – | 10.27 | 3.43 | 3.52 | 1.07 | (0.38) |
| Carbonate | mEq/L | – | 1.00 | 0.21 | 0.28 | 1.14 | 0.22 |
| Bicarbonate | mEq/L | – | 5.06 | 1.99 | 1.17 | 0.27 | 0.28 |
| Chloride | mEq/L | 0.50 | 41.89 | 8.76 | 9.45 | 1.85 | 2.29 |
| Sulfate | mEq/L | 0.09 | 93.99 | 30.04 | 19.56 | 0.96 | 0.47 |
| **30–60 cm** | | | | | | | |
| pH | - | 7.18 | 9.45 | 8.24 | 0.42 | (0.27) | 0.05 |
| EC | dS/m | 0.03 | 1.25 | 0.18 | 0.21 | 2.31 | 6.21 |
| Sodium | mEq/L | 2.59 | 35.24 | 16.38 | 8.50 | 0.52 | (0.55) |
| Potassium | mEq/L | 0.08 | 25.69 | 5.35 | 5.02 | 1.65 | 2.87 |
| Calcium | mEq/L | 0.60 | 17.22 | 5.89 | 5.64 | 1.16 | (0.23) |
| Magnesium | mEq/L | 0.02 | 7.11 | 2.56 | 2.21 | 1.00 | (0.20) |
| Carbonate | mEq/L | – | 1.50 | 0.32 | 0.40 | 1.24 | 0.86 |
| Bicarbonate | mEq/L | – | 4.70 | 1.93 | 1.05 | 0.02 | (0.23) |
| Chloride | mEq/L | 0.50 | 33.18 | 8.64 | 9.12 | 1.78 | 1.87 |
| Sulfate | mEq/L | 3.40 | 51.23 | 20.84 | 10.89 | 0.78 | 0.09 |
| GWTD | m | (3.8) | (1.2) | (3.23) | 0.92 | 1.29 | 0.14 |
| Distance from the water body | km | 0.05 | 0.9 | 0.4 | 0.23 | 0.19 | (0.58) |
| Irrigation time | year | 0 | 13 | 8.83 | 4.61 | (0.95) | (0.91) |

SD– standard deviation; GWTD – annual mean groundwater table depth below the surface; () – negative value of a number

Table S2. Principal component (PC) analysis results of soil variables

| | pH | EC | $Na^+$ | $K^+$ | $Ca^{2+}$ | $Mg^{2+}$ | $CO_3^{2-}$ | $HCO_3^-$ | $Cl^-$ | $SO_4^{2-}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| **0–30 cm** | | | | | | | | | | |
| PC1 | (0.55) | 0.76 | 0.73 | 0.45 | 0.89 | 0.90 | (0.22) | 0.10 | 0.57 | 0.87 |
| PC2 | 0.56 | 0.07 | 0.38 | 0.66 | (0.31) | (0.22) | 0.68 | (0.25) | 0.31 | 0.18 |
| PC3 | 0.36 | 0.27 | 0.03 | 0.12 | (0.09) | (0.13) | (0.21) | 0.91 | 0.03 | (0.05) |
| PC4 | 0.24 | 0.11 | 0.23 | (0.18) | (0.02) | 0.04 | 0.03 | (0.06) | (0.70) | 0.42 |
| **30–60 cm** | | | | | | | | | | |
| PC1 | (0.67) | 0.70 | 0.79 | 0.31 | 0.92 | 0.86 | (0.37) | 0.09 | 0.76 | 0.73 |
| PC2 | 0.48 | (0.10) | 0.41 | 0.66 | (0.14) | (0.15) | 0.53 | (0.66) | 0.08 | 0.44 |
| PC3 | 0.33 | 0.08 | 0.10 | 0.47 | (0.19) | (0.20) | (0.51) | 0.56 | (0.17) | 0.24 |
| PC4 | (0.05) | 0.52 | 0.20 | (0.37) | (0.07) | (0.16) | 0.22 | 0.03 | (0.53) | 0.35 |

() – negative value of a number