

Review of: "Probabilistic Assessment of the Heavy Metal Pollution in Debrecen's Topsoil"

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Potential competing interests: No potential competing interests to declare.

First of all, I want to appreciate the opportunity to review this manuscript that I find very interesting and an important topic, and I commend the efforts of the authors in conducting this research that will lead to a better understanding of pollution in Debrecen's topsoil by toxic elements (heavy metals and metalloids). The manuscript is well-written and contains several important results. However, the manuscript may be improved in various areas to increase its impact and clarity. In the following parts, *I will provide comprehensive comments and ideas.*

1. **Starting with the title**, since the study is conducted in Hungary and focuses on Potentially Toxic Elements (PTEs) (heavy metals and metalloids), I suggest the following changes: ***"Pollution assessment of Potentially Toxic Elements (PTEs) of Debrecen's Topsoil in Hajdú Bihar County, eastern Hungary."***

2. **Study area:**

- The authors could improve this section by providing relevant information about the geomorphology, geological setting, and climate of the studied region.
- Provide (if possible) geological, pedological, and elevation maps of the region.
- The figure of the study area, with the samples, is missing.

3. **Methodology:**

- Sampling: The authors could further enrich this part by giving more details and a comprehensive explanation of the sampling strategy adopted and by including a description of the various soil types sampled in the region.
- Statistical analysis: I would recommend that the authors include the rationale behind choosing the Kriging method over the Inverse Distance Weighting (IDW) method. This would help readers comprehend the exact benefits or factors that influenced this choice.

4. **Results and Discussion:**

- The results support the conclusions, and they are clearly presented by the authors (in the form of tables and figures), but they would be strengthened by additional references from the literature, especially in the section of statistical descriptions.
- Spatial pattern: More explanations are needed concerning the stretch of PTEs across the study area (the major sources of contamination should be discussed).

- What is the type of mining activity mentioned in the PCA section?
- More discussions and comparisons with previous studies in the same area could be provided.

I believe that this manuscript will make a valuable contribution if the authors consider all the suggestions and corrections provided by the reviewers.