Review of: "Spatial Analysis of Soil Fertility Using Geostatistical Techniques And Artificial Neural Networks"

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Potential competing interests: No potential competing interests to declare.

Summary: The authors assessed the soil fertility experimentally and theoretically and classified the soil into several categories on a digital map. Ten soil parameters have been used to evaluate the soil fertility. The theoretical results presented in this study were based on several theoretical techniques such as the ordinary kriging method to quantify the spatial variability and fuzzy neural network for classification purposes. The paper is well-written and logically prepared with conclusions based on the results of the research. The methodology of the research and the conclusions of the manuscript are important. Some suggestions are recommended to be taken into consideration that make the paper clear and more beneficial.

Introduction

1. Some cited references were not found in the list of references such as Lin and Lee, 1996. It is recommended to check all the cited references with the list of references.

2. The introduction needs more literature review focused on the theoretical base of the research especially fuzzy neural networks in addition to the spatial variability theories.

3. The geological information written for the study area needs evidence. Please, write a reference for the sentence “Quaternary geological, with a moderate pedogenetic development, and are of moderate fertility”

Methodology

4. Please, add the specification of soil sampling and the type of samplers.

5. It is recommended to add all the specifications of the laboratory tests.

6. What did you mean by MS “The MS evaluates the systematic error and indicates..” Please check it.

7. The term SSE is also not clear and has not been defined. Please, check it.

8. The theoretical basis of the research has not been stated by using some mathematical expression and more details are needed about the theoretical basis of the research

Results

9. The author mentioned that “the coefficients of variation of the variables as a whole do not present problems in

terms of the existence of extreme data values". Please, discuss the high value of COV (EC, 63%), (P, 57%) and the outlier definition confirming that there is no problem with outlier values.

10. The text inside Figure 5 is small in size and not clear. It is recommended to enlarge the size of the text.

11. The values of ASE are not close to zero, while the authors stated that the results of the validations of the soil variables are shown in Table 3, where the low values of the prediction errors, which are very close to zero for the ME, MES, and ASE indices, can be observed. Please, revise that.

12. The authors stated that "For all the cases evaluated, the RMS values are lower than the standard deviation, and are therefore adequate for the evaluation of the prediction models". However, some of them are greater than the standard deviation.

13. 12. Figure 6 needs more discussion stating the criteria for selecting the class of soil fertility since there are classes that have less FPI. It is recommended to discuss the lower value of FPI versus the number of soil fertility classes and demonstrate the criteria.

14. It is suggested to add a column that gives the criteria and range of value for every quantity tested in this study and at which the soil fertility is optimum or accepted.

a. Several notes have been recorded concerning references. I suggest reviewing the references carefully. Some examples of the mistakes are stated below.

b. The following reference needs more information

Burrough, P. 1986. Principles of geographical information systems land resources assessment. Clarendon Press Oxford. 193 p.

c. The following reference was not found in the list of references

Lin and Lee, 1996

d. The name of the research author in the text is different from that in the list of reference

Bezdeck et al., 1992; "Marcheti, 2010

e. Check the name and the year for the following reference. it may be 1984

Bezdeck, 1981

f. check the existence of the following reference in the list of references

Ovalles and Rey, 1994