

Review paper: **Farmers' adaptive capacity towards soil salinity effects using hybrid machine learning in the Red River Delta**

Code: **egusphere-2025-1051**

General comments:

Soil salinity, which significantly impacts agricultural activities worldwide, is considered one of the major environmental hazards caused by both natural and human-induced processes. This phenomenon has become increasingly severe due to the impacts of climate change, particularly rising sea levels. Therefore, evaluating soil salinity is regarded as a critical task for supporting sustainable agricultural planning. Additionally, evaluating adaptive capacity is considered an essential tool to mitigate the effects of soil salinity on community livelihoods. One of the strengths of this article is the integration of physical data, machine learning models, and socio-economic data (through interviews with local populations). As such, this article is highly relevant and well-aligned with the journal's scope. I accept to publish this article with the condition of major revisions.

Main comments:

Abstract: Although the authors present the objectives, data, and results of the article, I would like to see the inclusion of quantitative results and the significance of the findings.

Introduction: It is necessary to highlight the significance of this article. Additionally, it is important to emphasize the role of adaptive capacity in reducing the effects of soil salinity.

Study Area: The reasons for selecting this study area should be explained in more detail, especially the effects of soil salinity on agricultural activities.

Map 1: Please revise Map 1 for better clarity.

Map 2: Similarly, Map 2 should be revised for better quality.

Methodology: This study uses machine learning and optimization algorithms to construct the soil salinity map. However, I do not fully understand how the authors constructed these models. A more detailed explanation is needed.

Interviews with Local Populations: The inclusion of the interview methodology is necessary because adaptive capacity is a key outcome.

Discussion: Although this article clearly discusses the strengths and weaknesses of the machine learning models, and also touches on the adaptive capacity of the populations, I believe it would be useful to add the methodology for addressing the effects of soil salinity at the community level.

Extrapolation Issues: In this section, the authors present issues of extrapolation. I would suggest expanding on this point, as it is a challenge not only in soil salinity but also in other types of natural hazards.