

This manuscript developed a WSDR (Water Supply-Demand Risk) analytical framework based on the PLUS-InVEST model to investigate the water supply-demand risks under 24 climate-land use change scenarios in the Tailan River Basin (TRB), and to quantify the impacts of climate change and human activities on water supply-demand patterns and associated risks in the TRB. The study demonstrates a certain level of systematic analysis; however, substantial revisions are still needed in terms of textual presentation, results analysis, and discussion. The specific issues are as follows:

Q1: Further refine the scientific questions and highlight the key findings in the abstract.

Q2: The introduction is overly lengthy and should transition to the main topic more quickly. Moreover, it lacks a sufficient literature review on the limitations of existing water supply-demand studies and does not clearly articulate the novel contributions of this study.

Q3: The description of the study area is insufficient. For example, the size of the basin is not provided, so it is unclear whether the basin is representative. It should be clarified whether a single basin can reflect the general conditions of arid regions. In addition, it is recommended to include spatial distribution maps of land use, precipitation, temperature, and evapotranspiration in the appendix to help readers better understand the basin.

Q4: In the land use scenarios, the land conversion probabilities range from 5% to 30%, which is a considerable variation. What is the rationale behind setting such a wide range of probabilities? How much uncertainty do these different probabilities introduce into the results?

Q5: In the ecological protection scenario, only the conversion between other land types and construction land is considered. Why is the conversion between natural forests/grasslands and other land types not taken into account?

Q6: The figures should be made clearer. Please check whether all numbers and labels in the figures are explained to ensure that each figure is independently understandable. For example, what does the color bar in Figure 6 represent? What do the percentages in Figure 8 indicate?

Q7: Many of the statements in the results section lack data support and should avoid speculative or inferential language. For example, in line 399, the statement should be supported by relevant indicators quantifying land use structure. In line 403, the section does not analyze the driving factors of land use change—on what basis is the claim about cropland expansion made? In line 415, why is an external source cited—are the results derived from the data in this study? Are the statements in lines 454 and 470 supported by data?

Q8:The discussion lacks depth and should include more references. It is recommended to expand the discussion based on the study's results, strengthen horizontal comparisons, and especially highlight similarities and differences with previous research.

Q9:Lines 579–581 state that the impact of climate change on water supply is far greater than that of land use change. However, based on the methodology, the climate scenarios and land use scenarios are not directly comparable. Is it appropriate to directly compare the magnitudes of their effects on water supply? The same concern applies to lines 598–601.

Q10:The methodology for identifying the driving factors influencing water supply, demand, and associated risks is not clearly described. The results appear to rely on the authors' assumptions and lack adequate data support. For example, in lines 577–579, it is recommended to include figures or tables showing how climate, soil, and vegetation influence water yield.

Q11:The discussion section contains redundant content, with many statements unrelated to the core findings of the study. It lacks in-depth attribution and mechanistic analysis of the results, as well as horizontal comparison with relevant literature. For instance, Section 4.1 extensively discusses the importance of land use and reiterates the land use scenario results and ecological implications, but pays limited attention to the mechanisms by which land use change affects water supply-demand dynamics. It is recommended to delete or simplify this section. The analysis of the number of driving factors influencing the model could be combined with the uncertainty analysis.

Q12:Please verify whether the logic in lines 591–592 is incorrect. There may be an inconsistency or misinterpretation in this statement.

Q13:Provide supporting evidence for the statements made in lines 628–633. The manuscript does not appear to contain relevant research results or cited references to substantiate these claims.

Q14:Check whether the logic in lines 650–652 is flawed. The reasoning may be unclear or contradictory.

Q15:Streamline sentence expressions throughout the manuscript. Ensure that capitalization and punctuation are used correctly. For example, inconsistencies can be found in lines 54, 207, 210, 258, 357, and 476.