Response to Reviewers' Comments

Dear Reviewers,

Thank you for taking the time to review our manuscript. Based on your feedback, we have implemented the following changes. We have organized the changes according to the specific suggestions made by comment type, ensuring that each point has been addressed thoroughly and effectively.

About Content feedback:

- **Comment 1** "Although the motivation of this work is clear, the simulation results should be clearly explained. The authors should clearly define the main variables such as irrigated area, irrigated area adjustment, increase rate, discard rate. The units should be clearly stated".
- We have made updates to Section 4.1 to provide a more detailed explanation of the variables used in the study. Specifically, we have added a new paragraph that describes each variable and have classified them according to the type of element they represent. Additionally, we have provided comprehensive information about the units used in Table 3 of Section 4.4
- **Comment 2:** "In Section 5 the authors state the model is simulated and validated. How are these data validated? Did the authors make an experimental campaign? The authors should clearly explain the experimental tests carried out to validate the model. In addition, some metrics should be included to quantify the errors"
- We have restructured Sections 4.4 and 4.5 to provide a clearer and more comprehensive explanation of the Verification and Validation process for the Irrigation models. In addition, we have included a new figure (Figure 5) to enhance the details of this process. To support these revisions, we have added two additional references [20, 21]. We hope that these changes have further strengthened the quality of the paper.
- **Comment 3**: "Table 6 should be explained."
- We have revised and expanded the description of Table 6 in the second paragraph of section 5.2, providing more details about the feasible and non-feasible experiments based on parameter combinations.
- **Comment 4:** "the validation process of the model is not clearly defined, and whether the authors have carried out real experiments to validate it."
- We have restructured Sections 4.4 and 4.5 to provide a clearer and more comprehensive explanation of the Verification and Validation process for the Irrigation models. In addition, we have included a new figure (Figure 5) to enhance the details of this process. To support these revisions, we have added two additional references [20, 21]. We hope that these changes have further strengthened the quality of the paper.
- **Comment 5:** "does not see a clear explanation of the input variables of the model and the output variables."
- In section 4.3, paragraph 3 we included the input and output variables.
- **Comment 6:** "need to provide a clearer technical description of these models CLD, SFD, along with greater details on the simulation model as well"
- We have restructured Section 4.1 to include additional details about the Causal Loop Diagram (CLD), including a description of the variables and their corresponding element types within the diagram. Additionally, we have improved the clarity and comprehensiveness of Section 4.3 by providing more detailed explanations in the first three paragraphs about the System Feedback Diagram (SFD) and its applications. These revisions aim to enhance the reader's understanding of the concepts and methods presented in the paper.

- **Comment 7:** “when stating "Following the simulation methodologies from the literature (Banks, 1998)", they should say what type of simulation model was designed (discrete-event, agent-based,...);”
    - In section 4.3 we added the type of simulation model designed for irrigation system.
- **Comment 8:** “on what basis they decided to simulate a model 5 times”
    - In the last paragraph of Section 4.3, we briefly mentioned the simulation time, which is explained in greater detail in Section 4.4 where we have included Table 3. Furthermore, the analysis of simulation time is also discussed in Section 4.5, which is illustrated by Figure 5c.
- **Comment 9:** they should explicitly state what verification and validation techniques were applied (I just see numbers, some of which lack source and/or units of measurement);
    - We have restructured Section 4.1 to include additional details about the Causal Loop Diagram (CLD), including a description of the variables and their corresponding element types within the diagram. Additionally, we have improved the clarity and comprehensiveness of Section 4.3 by providing more detailed explanations in the first three paragraphs about the System Feedback Diagram (SFD) and its applications. These revisions aim to enhance the reader's understanding of the concepts and methods presented in the paper
- **Comment 10:** “what distribution functions they used to generate the irrigation time (between 0.25 and 1.5 hours) and the discard fraction (between 0.10 and 0.45)”
    - In the third paragraph of Section 4, we provided a detailed explanation of how we obtained the values for irrigation time. Additionally, in the first paragraph of Section 4.7, we highlighted how these parameters were used in the experiments. To clarify the values for discard fraction, we have restructured the first paragraph of Section 4.7 and made reference to Table 5.
- **Comment 11: “**they should include results of scenario n°5 and 6 that are missing from Table 6 and are not mentioned throughout the text.
    - Experiments 5 and 6 played a crucial role in the validation and verification process by serving as a starting point for the experimentation design. However, it is important to note that this process involved combining multiple parameters, as explained in Figures 5 and 6, and Table 4.

For Comments about Image resolution and template feedback:

We have made several updates to the paper to enhance its quality and presentation. Specifically, we have updated the format to comply with the required template, resulting in a more streamlined and cohesive presentation of the research findings. Additionally, we have replaced the figures with higher resolution versions, which have improved their visual clarity. Due to limitations in the number of pages, we have included Appendix A, B, and C in a GitHub public repository and have made corresponding references in the text. We believe that these changes have improved the overall quality and readability of the paper.

For Form Issues feedback:

We sincerely thank Reviewer 3 for their invaluable comments and suggestions, which have greatly enhanced the quality of our manuscript. We carefully considered each of their insights and worked diligently to ensure that our writing is clear, concise, and effectively conveys our research findings. We are truly grateful for their time and expertise, which have been instrumental in improving our work.

Sincerely,
The authors.