For research article

Response to Reviewer 2 Comments

1. Summary

Thank you very much for your thorough review of our paper entitled " An optimized SSGAN rice extraction method based on time-series sentinel images". We greatly appreciate the time and effort you have taken to provide such detailed and constructive feedback. Your comments and suggestions have been invaluable in improving the quality and clarity of our work. Please find the detailed responses below and the corresponding corrections highlighted in the re-submitted files.

2. Questions for General Evaluation	**Reviewer's Evaluation**	**Response and Revisions**
Does the introduction provide sufficient background and include all relevant references?	Yes	
Is the research design appropriate?	Yes	
Are the methods adequately described?	Can be improved	
Are the results clearly presented?	Can be improved	
Are the conclusions supported by the results?	Yes	

3. Point-by-point response to Comments and Suggestions for Authors

Comments 1: *In my opinion, the section Study Area and Data should be included in general section Materials and Methods.*

Response 1: Thank you for your suggestion, we have revised the manuscript framework and included the Study Area and Data in the Materials and Methods.

Comments 2: *Line 312 – why did you use NDWI instead of NDMI? As far as I know, NDMI is better indicator of plant health, while NDWI is used primarily to determine the water bodies boundaries.*

Response 2: Thank you for your comments. The reason for using the NDWI index is primarily because rice cultivation typically involves agricultural irrigation stages, where a continuous or periodic water layer covers the soil to control weeds and pests. Therefore, the temporal variation of water content in the fields is a key factor in extracting rice crops. In summary, we mainly focus on the changes in water bodies in the fields over time, while NDMI primarily extracts the moisture content of vegetation, which is why we use the NDWI index.

Comments 3: *Methodology for the Mean Intersection over Union (MIoU) and Overall Accuracy*

(OA) indicators should be added in the Materials and Methods section of the article.

Response 3: Thank you very much for your suggestion, we have added the methodology for MIoU and OA to the Materials and Methods section, with specific content added in lines 463-482.

Comments 4: *Overall accuracy of rice extraction rarely differs more than 5% by the data amounts and methods. Is it fair in this case to tell what method is superior to the others? Additional statistical prove for the significance of these differences would be beneficial.*

Response 4: Thank you for your comments. The accuracy evaluation metrics we used include Overall Accuracy (OA) and Mean Intersection over Union (MIoU). Indeed, as you mentioned, the OA of rice extraction rarely differs by more than 5%. You are absolutely right, and the method you proposed is also very good. However, the difference in the MIoU metric is significant. From the perspective of data volume and methods, the optimized SSGAN improves accuracy by at least 4.25% and up to 8.65% compared to the baseline SSGAN. OA provides a quick overview of model performance, but it may not adequately reflect the model's performance on imbalanced datasets. IoU measures the ratio of the intersection to the union between the predicted results and the true labels, while MIoU calculates the average MIoU value for each category, allowing for a more comprehensive assessment of the model's performance across all categories. Therefore, although the improvement in the OA metric is not significant, the substantial enhancement in the MIoU metric indicates that this method is superior to another method.

4. Response to Comments on the Quality of English Language

Point 1: I am not qualified to assess the quality of English in this paper.

Response 1: Thank you very much for taking the time to review this manuscript.