Dear the reviewers and the editor,

Manuscript ID ESSD-2024-402 entitled “20 m Africa Rice Distribution Map of 2023.” We would like to express our sincere gratitude to the editor and the reviewers for your constructive feedback and thorough review of our manuscript. We have carefully considered all suggestions and have made the corresponding revisions to the manuscript. In addition to addressing the reviewer’s comments, we have also refined the captions of certain figures to include copyright statements. Below, we provide detailed responses to the reviewer's comments, including clarifications where necessary. We hope these revisions address the concerns and uncertainties raised by the reviewer. In the manuscript and this file, the red parts are revisions suggested by the reviewer 1. And the green parts are the changed contents responsing to remarks from the preceding review file validation.

Sincerely,

Hong Zhang

Response to Reviewer 1

Comments to the Author:

The authors have done a good job in addressing the major concerns, except that they still did not improve the low accuracy's of a few countries with relatively smaller area of rice paddies. However, they authors provided reasons why it may not work as well as others. The authors could provide more insights of how to improve that in future maybe.

RESPONSE: Thank you very much for your constructive feedback. We greatly appreciate your recognition of our work and your constructive suggestion regarding the improvement of mapping accuracy in countries with relatively small areas of rice paddies. In response to your comment, we have added a discussion to section 5.1 about the possible improvements can be made in the future from two aspects.

To improve the mapping results of the countries with low accuracies, the current mapping results could be used as a reference to expand the sample set for a new round of training and classification. Considering the reduced spatial heterogeneity in these smaller regions compared to the entire African continent, a more detailed analysis of rice phenology could be conducted to enhance classification performance.

To improve the proposed mapping process, we suggest employing weakly supervised learning algorithms to automatically augment the training sample set, guided by feature importance, to ensure the reliability and robustness of the generated samples.

We hope these revisions address your concerns, and we sincerely thank you again for your insightful suggestions, which have helped improve the quality of our manuscript.

Page 28-29, Line 467-477:

Moreover, the sample set in this study was constructed through visual interpretation, assisted by the fast coarse positioning feature. As discussed in the overall accuracy part of Section 4.4, when conducting sample set construction in countries with very small areas of rice (such as South Sudan, Niger, Zambia, Angola, and Sudan), the difficulty to locate rice plots is still huge since wetlands are similar to but much more than rice paddies in the feature map, resulting lower OA in these countries. To enhance the mapping accuracy in such countries, the current mapping results could serve as a reference to develop an expanded sample set for a new round of training and classification in future work. Given the relatively small spatial extent of these regions compared to the entire African continent, the spatial heterogeneity is significantly reduced. This allows for a more detailed analysis of rice phenology, which could substantially improve mapping performance. To improve the effectiveness of the proposed method of mapping rice at a large

scale, weakly supervised learning algorithms could be employed to automatically augment the training sample set and improve classification accuracy in future studies. The sample expansion process could still be guided by feature importance to ensure the reliability and robustness of the generated samples.

Response to remarks from the preceding review file validation

To the Author:

Regarding figures 2, 3, 6: I just noticed that your figure ... contains a map. To clarify whether a copyright statement or a credit must be given in the map itself or in the caption, we differentiate between (a) maps entirely created by you, (b) maps created by you but based on layers reused from other originators, or (c) maps simply reused from other originators. An example for (a) is a digital elevation model (DEM) purely based on measurement points collected by you and derived by using a software product. If you use an existing map layer from another originator as a basis for significantly enriching the map with your own content, this would be an example for case (b). Case (c) could be a pure reproduction of Google Maps where your own contribution is rather small (e.g. a city map where you only added a few marks for your study locations). If the map was entirely created by you (case a), there is no need to change the caption or map. Please simply inform us. To the contrary, if your map follows cases (b) or (c), please let us know whether the map is distributed under public domain. If yes, please do not include a copyright statement (copyright is waived) but consider adding a credit to the map or caption. However, if your map follows cases (b) or (c) and is not distributed under public domain, please include at least a credit or even a copyright statement (e.g. © Google Maps), if this is required by the map provider, in the map itself or in the caption.

RESPONSE: Thank you for your kind remind and sorry for the trouble. For clarification, GIS country boundaries in Figure 2 are available from GADM (https://gadm.org), which is implemented in the caption. For Figure 3 and 6, we added the copyright statement in the caption.

Page 6, Line 122-124:

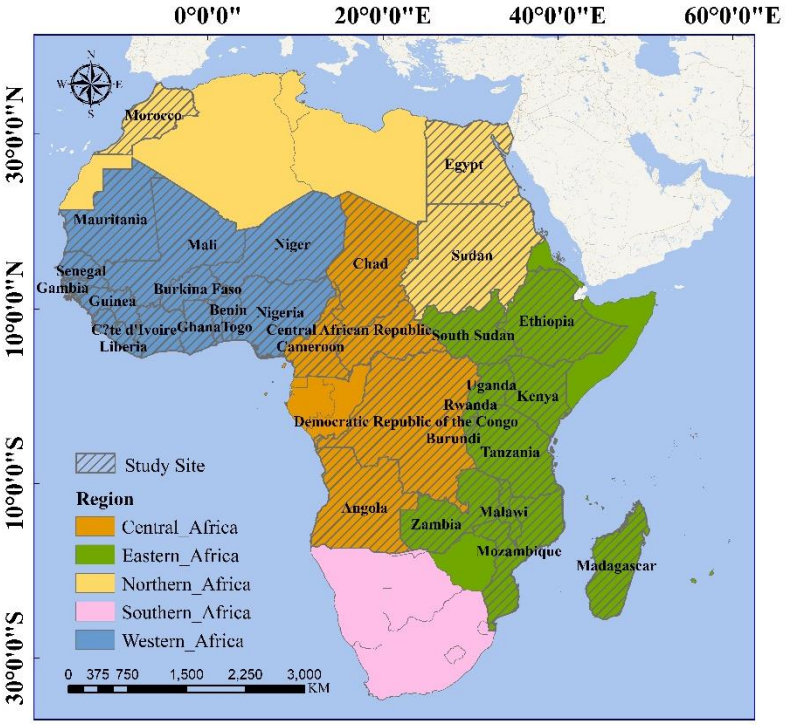

Figure 2. Study site: 34 countries in Africa with rice harvest areas exceeding 5000 hectares in 2022 according to FAO (diagonally marked area). GIS country boundaries in Figure 2 are available from GADM (https://gadm.org)

Page 9, Line 166-167

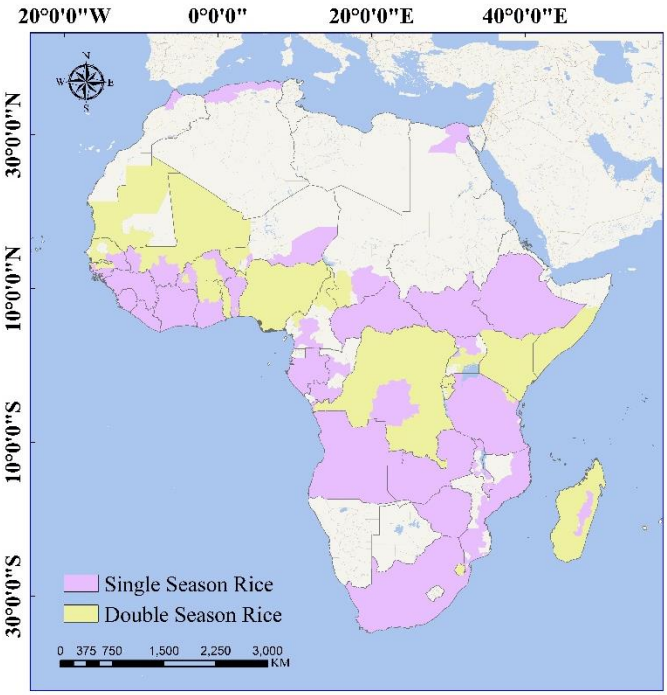

Figure 3. Administrative distribution map of rice intensity from ©RiceAtlas

Page 13, Line 231-233:

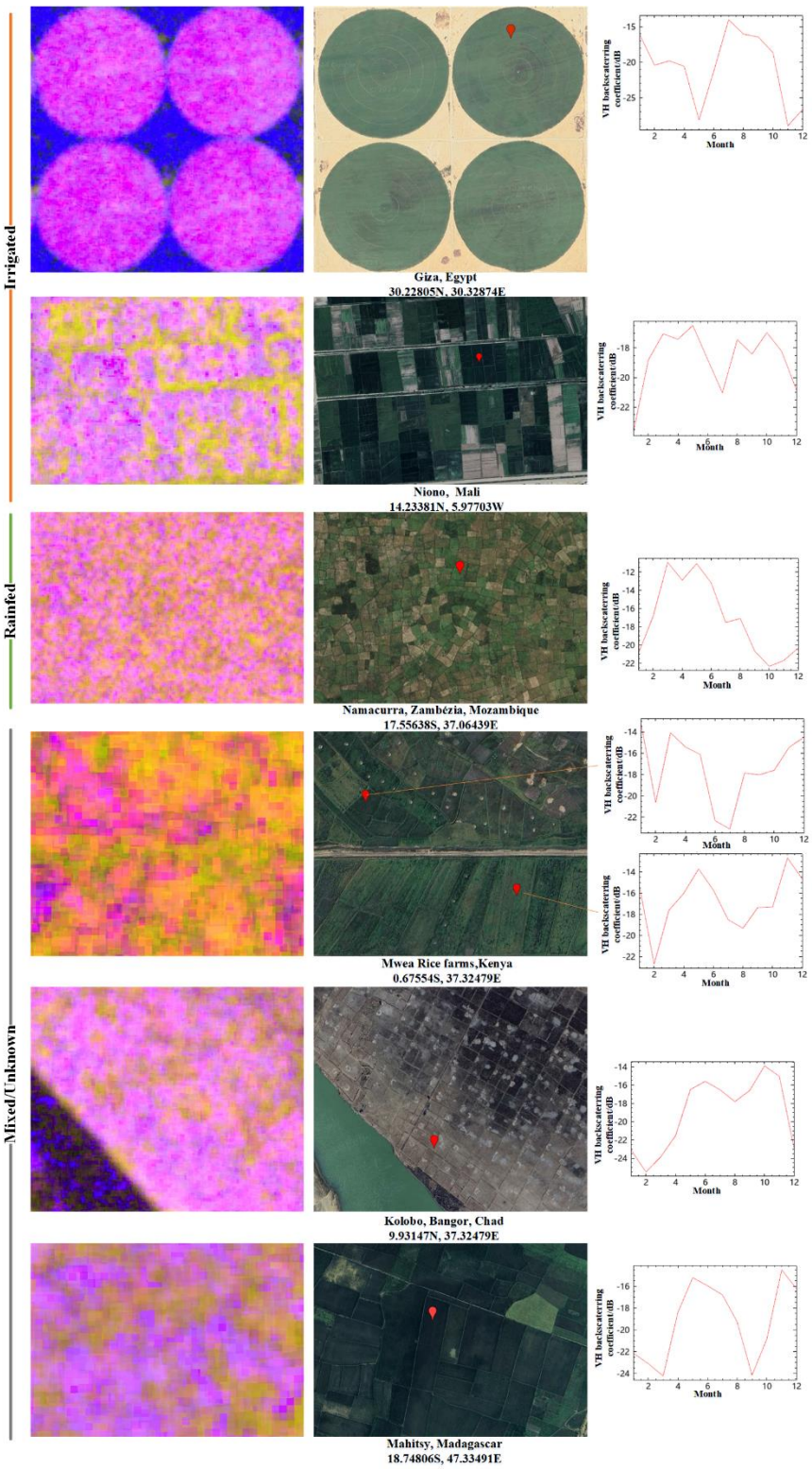

Figure 6. Examples of rice fields (a) Pseudo-color composite image (R: VHmax, G: VHmin, B: VHvariance) (b) Optical image(From ©Google Earth) (c) VH backscattering coefficient time series curve of the point marked in (b)