

Earth Syst. Sci. Data Discuss., referee comment RC1  
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## Comment on **essd-2022-273**

Anonymous Referee #1

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Referee comment on "AsiaRiceYield4km: seasonal rice yield in Asia from 1995 to 2015" by Huaqing Wu et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2022-273-RC1>, 2022

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This manuscript developed a high spatial resolution (4km) rice yield dataset from 1995 to 2015, covering major rice growing seasons and regions in Asia. Overall, this dataset would be a good complement to current rice yield products due to its high spatiotemporal resolution. I have the following questions or suggestions, which may help improve the manuscript clarity.

Major concerns:

- The authors used the GLASS AVHRR LAI data to extract key crop phenological indicators for training, including planting, heading, and harvesting dates. However, since rice fields in Asia are very fragmented and the spatial resolution of GLASS LAI data (i.e., 0.05 deg) is not fine enough to capture pure rice LAI information, there should be mixed-pixel problems. How did the authors deal with these problems? In addition, I would say the extracted planting and harvesting dates are more of indicators of the early rapid growth and senescence stages rather the real planting and harvesting dates. The authors should clarify these conceptual differences to avoid possible confusions.
- The authors used the Pearson correlation analysis to identify those predictors with a significant correlation with rice yield at each administrative unit for training (Line 218-220). I'm curious if the authors trained the model in each administrative unit and then combined all the training results to get the rice yields for the entire Asian region. More explanations about the experimental implementations should be given. Meanwhile, how do the authors deal with the multicollinearity problems of these predictors? There is a significant correlation between the different predictors in Table S3. In addition, I found very limited information on hyper-parameters in the supplementary material, the authors may want to provide detailed information of those

parameters in each optimal model (e.g., how many hidden layers, node numbers, and max-depth, etc). Furthermore, in Line 295, detailed information on the trained 27 optimal models should also be give (maybe present in the supplementary material).

- The authors compared their dataset with observations via scatter plots (Figure 5). This is good. However, it would be better if the authors can additionally provide comparisons of the interannual variations in rice yield for each rice system (e.g., single, double early and later) in each country (there should be some survey data). The performance of your dataset in capturing interannual variations in rice yield is important.
- The authors used cumulative values of predictors (e.g., LAI and PDSI) in different phenological periods (e.g., vegetative and reproductive) to train models. However, these cumulative information has no actual physiological significance. Meanwhile, considering that crop phenological dates (e.g., planting and harvesting) vary from year to year, it would be better to use the average value of these predictors over each phenological periods for training (i.e., more comparable across years).
- I would suggest that the authors get editing help from someone with full professional proficiency in English, as the current manuscript has substantial language issues. I pointed out some, but not all.

Other concerns:

Line 72: When you say prediction, it is more of a future period than a historical period.

Line 112: Change "i.e., " to "e.g., "

Line 113: Change "Philippines" to "China": the season number of 12 and 13 should belong to China.

Line 117: Change "are" to "were".

Line 275: Have you tried any other proportions (e.g., 0.6/0.2/0.2) to examine the robustness of your datasets, trained models and evaluation results?

Figure 3: What does the legend mean? I didn't see any difference in the color of these dots.

Section 3.2: I would suggest moving this section to the end of "3 Results". Meanwhile, you

should add additional analysis of temporal variations.

Line 417: Add using: by "using" multi-source

Table S1: names of the local administrative unit presents the specific... -> names of the local administrative unit represent the specific...

Table S2: Provide the full names of these abbreviations in the footnotes.

Table S3: What do you mean in these rows:

The sum of for whole growing period

The sum of for vegetative stage

The sum of for reproductive stage

The maximum for whole growing period