

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC1
<https://doi.org/10.5194/nhess-2022-260-RC1>, 2023
© Author(s) 2023. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on nhess-2022-260

Anonymous Referee #1

Referee comment on "Multi-scale EO-based agricultural drought monitoring system for operative irrigation networks management" by Chiara Corbari et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2022-260-RC1>, 2023

With interest I have read this manuscript addressing a new drought index. The topic issued by the manuscript "Multi-scale EO-based agricultural drought monitoring system for operative irrigation networks management" is relevant and the structure of the manuscript is well organized. I personally think the manuscript has potential to be published, but there some aspects that need to be clarified by the authors, before I can recommend this work for publication. Based on this is that I recommend major revisions.

General comments:

Based on the title of this manuscript, please further discuss the added information of the ADMOS index for both (Chiese and Capitanata) operative irrigation networks. In particular, how this index can improve the water management? Is it applicable only for irrigated crop regions? On this later aspect it is also important to be clear in regard to the objective of ADMOS, it is meant only for monitoring or also for predicting droughts?

Another aspect which needs to be clarified and justified is related with the performing part of the evaluation of the ADMOS index against crop yield, is this evaluation valid if crops receive water through irrigation?

From the manuscript, it is not clear on what temporal scale the ADMOS index works, is the monthly, weekly? In addition and related to this, discuss what temporal scales which are needed by operative these different irrigation networks.

A particular concern is related with the high vs. low resolution analysis. The results are based on a small sample of data which show a considerable dispersion in the relationship

between ADMOS and rainfall and rainfall+irrigation. Why the authors seek for a linear relationship? Should the relationship be linear? How robust or significative are these results? Please discuss the potential drawbacks of all these considerations in the analysis.

Specific comments:

Improve in general the figure caption descriptions.

On several parts of the manuscript the word trend is used, but it remains unclear the particular meaning of it. Like for example "seasonal trend" and the examples listed below. Please clarify this aspect across all the manuscript.

Why is that the authors start the abstract section with "Drought prediction" if they will focus on monitoring? Of course both topics are of major important for a drought early warning system, but in this case I would suggest using the word monitoring.

I suggest modify "electromagnetic frequencies" for spectral bands

Are they Drought monitoring systems for irrigation regions i other regions of the planet? If they are, I consider that a paragraph related to irrigation networks background and how they use drought indices is needed.

On what temporal window is the ADMOS working? Weekly, monthly? Please clarify this

Line 76 Is the Global Integrated Drought Monitoring and Prediction System (GIDMaPS, <http://drought.eng.uci.edu>) still operational?

Line 79: CDI index should be an indicator and not an index following the WMO definition as it uses different indices separately and not combined in only one index as the SMADI (Soil Moisture Agricultural Index) for example. It is also important to highlight that the CDI uses different time dates for each variable, which is different to the USDM approach.

Line 149: An average irrigation volume of about 1200 mm is provided during the crop season, over a mean precipitation value of 250 mm. How are the irrigations estimated?

Line 283: "SMOS and SMAP anomalies do not show a seasonal trend as clear as that of the ESA-CCI datasets." But ESA-CCI considers a longer time period. What is meant with seasonal trend?

Line 307: "less peaked SM trend" As the authors don't mention a trend analysis, please clarify what is meant with trend?

Why the authors use SPI-1 and not SPI-3 or SPI-6?

Please specify what is the SMOS Root zone product.

Line 483: Please modify (Figure not shown) for (not shown)

Figure 12. In this figure is not clear while the ADMOS varies from 0 to -500, please explain clarify with more detail this values as the index form its definition varies from 1 to -4. Add also these details in the figure caption. Is it the accumulation value? Also, use the same amount of decimals for the R^2 and I recommend changing the units of m3 to millions of m3 or equivalent.

Line 532: What are the crop impacts of this "too much water is probably provided to the crops"? Please discuss how would the ADMOS help to this.

Line 555: Please clarify this sentence: "In particular, seven to eight soil moisture products anomalies have been compared and generally low Pearson correlation values are found with a better correlation in the Chiese area, probably due to higher average yearly rainfalls which correspond with a more stable, less peaked SM trend, easier to reproduce from products working at different resolutions and with different algorithms." What is meant with 7 to 8 SM products? Is not clear what is meant with less peaked SM trend? What is meant with low Pearson correlation values are found with a better correlation in the Chiese area?

Line 567: Change "plat" for plant

Figure 11. Please clarify on what temporal scale the index was accumulated? Monthly, Yearly?