

Hydrol. Earth Syst. Sci. Discuss., referee comment RC1
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Comment on hess-2021-285

Anonymous Referee #1

Referee comment on "Redistribution process of precipitation in ecological restoration activity of *Pinus sylvestris* var. *mongolica* in Mu Us Sandy Land, China" by Yiben Cheng et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-285-RC1>, 2021

The manuscript presents analysis of precipitation distribution in a Mu Us Sandy Land plot planted with *Pinus sylvestris* var. *mongolica* (PSM), over a period of four years. Total precipitation, soil water content, deep soil recharge and sap flow were directly measured, and other parameters (soil water storage, evapotranspiration) were calculated based on the measurements. The analysis of precipitation distribution in the PSM plot was compared to an adjacent bare sand plot to evaluate the effect of the PSM on the precipitation distribution. Overall, I find this manuscript valuable to the understanding of hydrological cycles in areas where vegetation restoration is implemented for desertification control. Hence, in my opinion the manuscript is worthy of publication.

However, in the current form of the report, the quality of the scientific work done by the authors cannot be fairly evaluated. The text contains multiple structure, coherence and grammar issues / mistakes and currently does not meet the quality standard for publication in HESS.

Some of the major issues that should be corrected in the revised version are related to the following:

- Correct construction of paragraphs including an emphasis on the flow of the text (i.e., connection to the next paragraph).
- Attention to the length and clarity of sentences.
- Definition of acronyms at their first mention and consistent use of the acronym after it has been defined.
- Captions of the figures and tables should describe in more detail what is shown in each panel / what are the parameters presented in the table.
- Correct use of grammar.

Below are some specific examples. The authors should note that these are merely examples, and the revision should include the entire text.

- **Abstract, line 1:** "Precipitation was the most important water resource in semi-arid regions of China". **The sentence communicates that precipitation is no longer the most important water resource in the semi-arid regions of China. I believe that the authors meant to convey that precipitation is the most important water resource in those areas (and therefore the paper focuses on the analysis of its distribution).**
- **General: pay attention to the excessive use of 'we' / 'we need to' / 'we decide' / 'we can select' / 'we set up' etc.**
- **Introduction, general: please refrain from excessive use of 'some researchers'. Note that when you state that 'many researches' have shown something you are expected to cite more than one paper.**
- **Introduction, line 46:** "Large-scale afforestation can affect water cycle like consuming vast majority soil water and regulating water redistribution process (Zhou et al., 2019;Zhang et al., 2018)." **Here and elsewhere, the use of the word 'like' in this context is incorrect.**
- **Introduction, line 65:** "Most of the forests in the 3NSP are rain-fed forest(Cheng et al., 2021b), thus whether the precipitation can supply the survival of reconstructed PSM and the precipitation redistribution in shallow soil layer is important in this rain-fed forest ecosystems, which affect the water balance of forest land and the biochemical cycle of this region". **This is an example of a very long and unclear sentence. Note the missing space before the cited papers (here and elsewhere).**
- **Introduction, line 67: the term PSM is used but it was not defined before.**
- **Introduction, line 96-106: this part of the introduction, describing the main goal of the study, the research questions and the expected contribution should be especially clear to the reader. Since there are several research questions, I'd suggest to number them and refrain from phrasing them as questions. The use of 'find out' ('The purpose of this study is to find out the effect of...') is not appropriate here. The use of 'try' in the context of the aims of the study ('We will try to understand') is also not appropriate. In line 105 the word 'exam' ('We will also try to exam') should be changed to 'examine'.**
- **M&M, general comment: overall the M&M section is very long and poorly organized.**
- **M&M, line 112:** "...a large area of vegetation restoration has been carried out since 1978." **In its current form, the sentence suggests that a large area has been carried out (which makes no sense grammatically).**
- **M&M, Figure 1: the different panels should be marked with letters (A, B, C, D) and the caption should be improved.**
- **M&M, line 125: the term BSL was already defined in line 103.**
- **M&M, line 144: the term DSR was not defined.**
- **M&M, line 144: 'Since 2015, the experimental field has been established'. This sentence is grammatically incorrect.**
- **M&M, line 190:** "It takes a certain time for the soil to settle down, so we need to install the instrument six months to one year in advance for the soil profile to settle down to its pre-excavation stage". **This is an example of a badly phrased sentence. The use of 'settle down' and 'a certain time' in this context makes the sentence unclear.**
- **M&M, line 199:** "The planting years of PSM in this region are the same, but the growth is not the same". **Unclear sentence.**
- **Results, line 272:** "ET was calculated by the water balance equation..". **I think that this should be explained in the M&M.**
- **Results, Table 1: the parameters T and E were not defined before but are used in the table. The caption should describe all the parameters that are presented in the table (the use of 'etc.' is not appropriate here).**
- **Results, line 350: this equation should have been presented in the M&M.**
- **Results, line 360-361: the phrasing of this sentence as a question is not appropriate here.**

Although a full evaluation of the quality of the manuscript is currently very difficult, below are some content-related comments that should be addressed or clarified:

- **Line 198:** "The sap flow flux equal to the transpiration of PSM". **Is this always true or is this true under a steady state assumption?**
- **Table 1:** the sum of SWS, DSR and ET adds up to < 100%. Please include a statement (or mass balance %) somewhere in the text.
- **Line 338-342:** a correlation coefficient of ~ 0.27 is presented for precipitation and evaporation in BSL and a correlation coefficient of ~ 0.99 is presented for precipitation and evaporation in PSM. Considering this, your conclusion in line 340 is not clear to me.
- **Line 368:** the sentence implies that solar radiation is presented somewhere in Figure 3. Since it is not – please rephrase this sentence.
- **Line 374:** "Thus, there was no difference in sap flow rates among dominant trees". **This is not a fact or a finding. It's an assumption based on the distribution of trees in the plot.**