SOIL Discuss., referee comment RC2
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Comment on soil-2021-2

Anonymous Referee #2

Referee comment on "Deforestation effects on soil erosion rates and soil physicochemicalproperties in Iran: a case study of using fallout radionuclides ina Chernobyl contaminated area" by Maral Khodadadi et al., SOIL Discuss., https://doi.org/10.5194/soil-2021-2-RC2, 2021

General comments

Overall, the study focuses on a relevant topic and presents interesting results and is therefore definitely worth publishing after some modifications and improvements to the current manuscript have been made. This manuscript represents valuable results, and a good approximation to better understand the differences and similarities between different methods to calculate soil redistribution rates and its relationship with some physical properties and soil nutrients.

The study includes interesting findings first reported in these areas of Iran and fits within SOIL scopes. However, in its current state, I think it requires quite a bit more work in terms of rearranging and editing before it is ready for publication. Overall, the study focuses on a relevant topic and presents interesting, results and is therefore worth publishing after some major modifications and improvements to the current manuscript have been made.

First, I think authors should clarify some of the previous reviewer questions. To avoid some repetition, I have been more focused on specific details. Apart from the general comments about each section, I have included some comments about the figures (14) and the text (17). An additional major issue I see in this manuscript is the enormous number of references included. If I am not wrong, there are more than 100 references. I think it is more than needed for a novel study.

Introduction

I think you need to emphasise this work's aims at the end of this section, the authors present an interesting study, but sometimes it is easy to get confused because the aim of the manuscript is repeated trough the introduction section. Thus, it could be useful to be more specific at the end of this section and reorder or rewrite some parts of the introduction.

Results and discussion

In this section, I would encourage the authors to synthesise the results and focus only on the results. Sometimes it seems that the discussion is a little bit mixed with the results.

Furthermore, I think more than 2800 words for the discussion section is excessive. In this section, authors tend to repeat most of the results, and there is an excessive number of comparisons with other studies. I think the manuscript could be reduced here. This statement is quite clear because authors have included more than 100 references, what it is just disproportionate. Don't you think? For example, 50-60 references are considered a high number of references, still acceptable but high.

Conclusions

I think that the text could be improved here (to avoid restricting it to a repetition of what was written before). The first 6 lines did not include a conclusion and just repeated previous parts of the manuscript. After a very rapid summary of the main results, you could stress the potential novel avenues for research in the future.

497 you could specify the location without using brackets, please rewrite the sentence.

496-500 Following table 1, the study pursued in Golestan Province with similar mean annual precipitation (MAP), showed significantly lower values than your study. Do authors think that all the difference could be due to the location even if both are located in the northern part of Iran?

Figures

Fig. 1 Subcatchment names are blurred and mixed with the division lines. I think you could create a different type of labels such as pin flags, for example.

The scale could be smaller, and a black-white style could fit better.

Instead of displaying the lake on the magnified Kurdistan province map, you could display the catchment limits.

Streams or rivers. These terms are pretty much interchangeable, but according to your scale, you have a stream with a length of 2000Km.

It will definitely help to visualise your study if you could include some pictures of the forest and vineyards.

Fig. 2 At least in my figure, the legend does not fit with the symbols. Furthermore, it is quite difficult to discern the separation between points. When plotting in Surfer (I think you used this software) the colours suffer a small colour change. Please try to modify your legend accordingly.

Is it true that your stream/river ends before reaching the outlet?

The height axis was not specified, and the meters cannot be seeing. If it is difficult to modify this in the software used, you could try to modify it by using additional graphical software.

The colour legend about the height is not specified. However, it would be nice to see the land use map over the DEM. It can be done in Surfer.

Fig. 5 I think you should use the same colour scale for both maps. Thus, you can easily compare them.

Fig. 6 What are the green dots? Please show it also in the legend.

Fig. 7 It is already nice, but you could improve by giving the equation the colour f the lines. However, do it carefully because maybe the green colour is too light to be correctly visualised.

Fig. 8 A little bit of colour here it would be nice.

Fig. 9 Same here, but just as a piece of advice.

Specific comments and technical corrections

Apart from the general comments, I have added some specific comments about the text and the figures. The authors might find them useful to improve their manuscript. "In my opinion", the inclusion of these points would significantly increase the audience interest of this manuscript that presents an interesting study. Here I have attached some typing error or minor suggestions to improve the text:

Line 38-39 I think this could better fit. "The transition/conversion from natural covers to cultivated lands have increased drastically."

Line 40 "more rapid than ever before" I think this is too much to state. Maybe something like this "the las century/or centuries" could do the job.

Line 55 "and the subsequent increase in soil erosion."

Line 55-56 This statement is too general. In the northern part of the Mediterranean region, especially in mountain agroecosystems, recent land-use changes produced just the inverse trend due to the land abandonment (that it is also a land use change). You could find many recent manuscripts using 137Cs and also 210Pb techniques that describe the issue, especially from Spanish an Italian catchments.

Line 63, 65, 69 just as a recommendation, I would prefer if you don't use the words "e.g." that much.

Line 98-100 These two sentences were repeated in the previous paragraph. I think you could reduce the text here and keep the MS focuses on your objectives.

Line 100 Did the authors missed a reference?

Line 104 runoff?

Line 111 "deforestation on and soil". Could it be mistyped?

Line 120 Figure two shows nothing related to 12 sub-watersheds. I think you should rewrite this paragraph to make it clearer for the readership. It is not very clear.

Line 121 It would be nice to include the data of max and min altitude here. You have graphically included in the figure, but it has not been specified.

Line 140 Besides,?

Line 143-15 A fragment could be missing. For what have they been constructed? I think it is obvious, but it would be nice to specify it; thus, making your point clearer to the readership.

Line 150 Keep the same style. Here you've used italics.

Line 247 This is an important part of the work. Thus, further description is needed.

Line 285 It would be nice to see a correlation matrix between all the properties.

Line 323 You cite a strong study about it, but you could also include the correlation of the data presented in Table 1. It will be only around 0.5 but still could support your discussion.