

Response to Reviewer 2

General comment: Thank you for your submission. This was an interesting manuscript that fits within the scope of SOIL. Greater attention to detail in certain areas of the manuscript will greatly improve its readability. It seems like a lot of generalities are stated in the intro, “global problem”, “worsening effects” but not a lot of details is provided to back up these claims. Some additional measures of the environmental and economic impacts of gully erosion would really be helpful. The results and discussion section was difficult to follow, I tend to find combined sections to be this way. The results of the gully remediation methods don’t seem to be the real takeaway but the impacts and perceptions of local communities? Could you restructure the results/discussion to make these points more clearly? Finally, since you are working with human subjects, did go through institutional review boards? I think that some statement to this effect is needed.

Response: *We are very grateful for the constructive feedback. We addressed all the comments and suggestions and revised our manuscript. We also presented the results and discussion section in separate sections. For more details, please see below the responses given for the specific comments.*

Specific comments

Introduction

Comment 1: Line 36: Could you provide some more context for gully erosion as a global problem? Contributions to marine/water pollution? Land degradation?

Response: *We appreciated this concern. but the global context is discussed in the first paragraph. Please see page 2, lines 29-37, in the revised manuscript. The second paragraph focuses on the problem in SSA.*

Comment 2: Lines 38-40: are these on the ground measurements or from model estimates? Could you specify?

Response: *The values are based on ground measurements, and we clarified this in the revised manuscript (please see page 2, lines 41-44 in the revised manuscript).*

Comment 3: Line 40: What are the economic costs? Could you provide an actual value to drive home your point about the high cost?

Response: *We agree with this comment and provided some examples of actual values. Please see page 2, lines 45-47, in the revised manuscript.*

Comment 4: Line 48: change to “Across different countries” and delete “of the world”. And what initiatives and where?

Response: *We removed this section in the revised manuscript for a better flow of information and to shorten the introduction section.*

Comment 5: Line 50: change big to large. And how much money and labor are required? It would provide context for the scale of the problem.

Response: *We agreed with this comment and addressed.*

Comment 6: Lines 53-55: These two sentences seem out of place and almost read like they are the start of another paragraph/thought. Should they be added to the paragraph below?

Response: We revised the sentences, please see page 3, lines 62-64, in the revised manuscript.

Comment 7: Lines 61-62: How much worse? Again, are there measures or statistics from these references to bolster your sentence?

Response: We agreed with this comment and addressed. Please see page 3, lines 72-76, in the revised manuscript.

Comment 8: Line 63: What do you mean by context specific? Could you clarify?

Response: This refers to measures that consider availability of resources and capacities of local communities, among others. This is included in the revised manuscript. Please see page 3, line 76-77.

Comment 8: Line 80: Add “on” after the word “demonstrating”

Response: Added.

Comment 9: Line 86: change “big” to “large”

Response: Changed.

Methods

Comment 1: Table 1. Demographic information would seem more appropriate to present in a separate table from the geophysical parameters.

Response: We appreciated this concern and revised the heading of the first column as site and household characteristics. This helps to reduce the number of tables. Please see page 6, Table 1 in the revised manuscript.

Comment 2: Table 2. Can you change z to “elevation” or “altitude” and add units. Can you also add units to x and y values? Are these lat or long?

Response: We agreed with this comment and addressed. Please see Table 2 in the revised manuscript.

Comment 3: Line 132-134: I think you mean higher clay content. Also, it is interesting that this soil has alternating Bt and E horizons? I’m assuming this is a loess-derived soil and that these are likely different loess packets?

Response: This could be possible as there is deposition in the mid slope positions where the experiments are established.

Comment 4: Line 140: you mean “comprising”.

Response: Yes and corrected.

Comment 5: Lines 151-169: I had a very difficult time understanding who was surveyed, where, and why. Especially once I started reading the results and discussion section. You had focus groups and a community-wide survey? In the community-wide survey? Some of these were in kebele with rehabilitated gullies and others weren't? Or were they all around gully rehabilitation projects and you were surveying them pre- and post-intervention?

Response: *We appreciate this concern. To make this clear, we reorganized the method section and provided sub-headings for the different sections. The household surveys were done in the treated and untreated kebeles. This is discussed in detail and clarified in the revised manuscript. Please see section method section in the revised manuscript.*

Comment 6: Line 162: change “big” to “large”.

Response: *Changed.*

Comment 7: Line 161-169: the description of the respondents is not clear as written.

Response: *We appreciate this concern and revised. Please see section 2.3 in the revised manuscript.*

Comment 8: Line 178: Can you not repeat key twice in one sentence? I know the discussion points and informants are important but you have already established this.

Response: *Addressed.*

Results and discussion

Comment 1: Line 206: Why assume a bulk density? You could use a pedotransfer function from your soil data to estimate a bulk density. See Rawls 1983 or similar papers for this.

Response: *We just assumed a typical range of bulk density of agricultural soils, as the aim was to provide estimated figures on soil loss.*

Comment 2: Line 301: What do you mean by free riders?

Response: *In this context, it refers to persons who want to benefit more by violating existing rules and regulations. This is clarified in the revised manuscript (page 14, line 349)*

Comment 3: Line 337-338: I'm not sure I follow this sentence? So benefits were mainly environmental and costs were mainly social?

Response: *The results suggest that benefit factors are mainly categorized as environmental and economic, whereas cost factors are largely related to social and economic costs. This is addressed in the revised manuscript. Please see page 16, lines 388-390, in the revised manuscript.*

Comment 4: Figure 6: What does the number refer to? Is this the sum of the ratings? I also think that since the mean rating can only be between 1-3, you should have these on separate figures. Or a two part figure.

Response: *We added more explanations in the figure caption in the revised manuscript.*

Comment 5: Table 5. Should you say treated-non-treated or pre and post intervention? Or are you comparing responses to areas from which you did not before any gully rehabilitation to areas that you did? Also how did you test significance?

Response: Yes, the surveys were done in treated and non-treated kebeles. These issues are addressed in the revised manuscript. Please see the study design and data collection and analysis sections.

Comment 6: Section 3.4 The description of the survey questions presented in Table 6 read more like methods and should be moved there. Also was this the same group of people that were surveyed in the community wide survey that results were presented in Table 5?

Response: Agreed and revised. We moved texts describing the methods and approaches to the data collection and analysis section in the revised manuscript. We also expanded the discussion and provided supplementary materials.

Comment 7: Lines 418-424: This paragraph seemed like a better conclusion than the current concluding paragraph.

Response: We appreciate this suggestion. We revised the conclusion section in the revised manuscript. Please see page 23 in the revised manuscript.

Comment 8: Acknowledgements. Who was the grant awarded to? Don't you also need to include some statements about IRB for using human subjects?

Response: This is addressed by adding the required information and ethics application. Please see page 24, acknowledgement and ethics application.