

## RESPONSE TO REVIEWER 2 (ANONYMOUS)

*The present manuscript by Pfeiffer et al. is a comprehensive review of key factors involved in the sustainability and productivity of African smallholder farms. I found the analysis to be insightful and appropriate and only have minor comments.*

Thank you for your positive evaluation of your work.

*The abstract would benefit from more numbers to make it more quantitative to help describe exactly what was found.*

We will add some numbers for the key results.

*There are minor usage issues throughout, the first is on line 34 (p. 2): "Livestock" is plural so the correct usage is 'Livestock provide..' (see also line 35; a quick review will correct any minor issues.) More: space after the period on L. 70, etc. (L. 89: "and cowpea" to distinguish between tubers after the comma.)*

Thank you for these editorial hints, we will incorporate them in the final manuscript.

*I found the last paragraph of the Introduction to be a bit confusing: listing the questions first and then the approach used would help lead into the specific study.*

We will restructure the paragraph to improve the flow of the logic.

*section 2.2: some of the crops are listed twice in the paragraphs beginning lines 99 and 105.*

We have checked this and found it is not the case; there is also no duplication in table 1.

*Please describe t/ha to distinguish between metric tons (or tonnes) and imperial tons. Obviously the former is more appropriate and I assume is used here, but the latter is in common usage in many places.*

It is metric tons. We will specify this explicitly when introducing the unit for the first time, or alternatively exchange the unit tons with Mg.

*LU is not defined at first use.*

Livestock unit. Sorry for the omission, we will add the definition.

*Results: I feel that there are probably too many significant digits for a modeling study throughout. For example 53 +/- 23 is probably more correct than 53.2 +/- 22.9, etc. The results were comprehensive but somewhat long, and an eye toward brevity would improve the Results section.*

We will check the number of significant digits throughout the manuscript, and see if/where we can shorten the results section.

*I guess that my biggest question regarding the outcomes is the suggestion for irrigation feasibility? This usually involves considerable expense and can have other deleterious consequences. A brief analysis of the likelihood or sustainability of irrigation would strengthen the conclusions.*

In our project area, there have been recent investigations (e.g. Lam et al., in review) that have shown that in some of the water catchments in future, there will indeed be a decline in available surface water and groundwater resources. In our scenarios, however, we have been referring to very restricted “deficit irrigation” which can be drawn from rainwater-harvesting, and drip irrigation from available boreholes and surface water without exhausting water resources as reported in Magombeyi et al 2018; Parry et al 2020).

*Magombeyi M S, Taigbenu A E and Barron J 2018 Effectiveness of agricultural water management technologies on rainfed cereals, crop yield and runoff in a semi-arid catchment: a meta-analysis J. Agric. Sustain. 16 418–41*

*Parry K, van Rooyen A F, Bjornlund H, Kissoly L, Moyo M and de Sousa W 2020 The importance of learning processes in transitioning small-scale irrigation schemes Int. J. Water Resour. Dev. 36 199–233*