

Clim. Past Discuss., referee comment RC1
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Comment on cp-2022-17

Anonymous Referee #1

Referee comment on "An Early-Mid Holocene process of regional desertification recorded in aeolian sediments from the northern slope of the middle Himalayan Mountains" by Yang Gao et al., Clim. Past Discuss., <https://doi.org/10.5194/cp-2022-17-RC1>, 2022

This ms attempts to use 'aeolian sediments' to document the Holocene history of regional desertification on the northern slope of the middle Himalayan Mountains.

I do not think the ms is worthy being considered for publication in CP, because of the following shortcomings.

Firstly, the topic is very regional and even local, lacking necessary support for large regional or global interpretations.

Secondly, the concept of 'aeolian sediments' is not clear. The studied sediments are loess deposits or dune deposits? These two types of sediments are radically different in climate/environmental significance, as is the basis of all the interpretations and conclusions. Fig 2 and the descriptions in the text/figures do not support for loess deposits because of the topography, the gravels within the section, the sandy texture with the mean grain size ranges from 90.71 μm to 230.65 μm . The field pictures and descriptions (e.g. Lines 66-67: Any sedimentary beddings were not found in the aeolian sands of this profile.) are also unsupportive for eolian dune deposits. Rather, the main features outlined in the text tend to support an origin of galley water-lain deposits (at least water-reworked

sediments). Such kind of deposits cannot be treated as environmental records for addressing paleoenvironmental histories. The relevant interpretations based on such records are of great uncertainties.

Thirdly, the used paleoenvironmental proxies are mostly ambiguous lacking explicit environmental significance. They are sometimes used for loess studies, but are not necessarily applicable for the studied sediments. The main conclusions (Lines 18-20: 'the strengthened Indian monsoon intensity, dry and warm climate, and sparse vegetation cover accelerated the rapid expansion of desertification between ~11 and 9.6 ka B.P, ..., The Indian monsoon intensity weakened between 9.6 and 6.3 ka B.P.') greatly differs from the earlier reported histories for Indian monsoon, while these are not discussed at all the the ms.