

Response report

Thank you very much for your E-mail of June 3, 2023. We appreciate the editor and reviewer's constructive comments and suggestions for our manuscript entitled "Human activities determine vegetation water use in the middle and lower reaches of arid areas" with the reference bg-2023-1.

According to the reviewer's comments, we have revised our manuscript carefully and the revised portions have been marked in red in the manuscript track changes version. The main corrections and the response to the reviewer's comments are as follows.

Responses to the reviewer's comments

Response to Reviewer #2

This study examined the water use patterns of vegetation along a moderate aridity and elevation gradient in Asia. Well-established methods were used to address patterns of plant water use. The focus is not particularly novel. The title suggests that "human activities" are a major focus of study but really this seems to be a study of vegetation water use patterns at 7 sites. The title suggests that the results can be generalized broadly but this study does provide justification for that.

Conclusions include that "precipitation and soil water" were the main water sources for forest trees, and that irrigation was the main source of water for farmland. These are not particularly compelling results as they are textbook expectations about the hydrologic cycle.

The discussion is lengthy and does not relate well to the data collected in the

study. The paper reads as an observational (rather than process-based) study combined with an extremely broad discussion of human water management. The merging is awkward. While the topic of the paper is appropriate for the journal, this paper primarily re-examines well-established processes without providing new insight. The writing is rough and vague in many places. Given these concerns I cannot recommend publication.

Response: Thank you very much for reviewing our article, your comments are very important for us to improve the quality of the paper. In this study, we mainly used precipitation, soil, vegetation, and groundwater samples collected at seven stations on different precipitation gradients (mountain, oasis, and desert areas) in the Shiyang River basin from 2017 to 2019 plant growing season (April to November), analyzed the relationships among precipitation, soil water, xylem water, and groundwater isotopes at the seven stations, as well as calculated the vegetation moisture sources at different stations, and combined with previous The reasons for the different sources of vegetation moisture in different regions are discussed in the context of previous studies. The innovation of this paper is that instead of studying vegetation water use at a single site, we analyze vegetation water use along the whole Shiyang River basin on different precipitation gradients (mountain (124~698mm), oasis zone (124~698mm), and desert zone (54~83mm)), and discuss the differences in vegetation water sources under different precipitation conditions, so as to further explore the implications for water management strategies in the Shiyang River basin.

Regarding your comment that the discussion is lengthy and not well integrated with

the data collected in the study, our ideas are mainly: in the results section, we show the results analyzed from the data we collected, explore the relationships among precipitation, soil water, xylem water, and groundwater isotopes at the seven sites, and quantify the sources of vegetation water at the seven sites; in the discussion section, we mainly analyze the reasons for the different vegetation water use at different sites, such as precipitation conditions and human activities, in conjunction with previous studies, and finally, thus, further explore the implications for water resources management strategies in the Shiyang River basin.

We have modified the article systematically and hope to get your valuable comments.