

Dear community referee,

Thank you very much for your valuable comments and constructive suggestions. Having carefully reviewed your feedback, we have gained significant insights and benefited greatly. We believe that revising according to your suggestions will greatly enhance the quality of our study. It is an honor for us to receive your review and guidance. The following are detailed point-by-point modifications made, with all changes already incorporated into the original manuscript. Once again, thank you for your review and feedback!

Community referee, 6 Sep 2024

The major comments are that the geographical regions should be distinguished more clearly and be used consistently in the whole paper.

First, “Northwest China” was used in title, but in fact, the paper divided the Northwest China into the eastern part (Northwest Agricultural Region of China (NWAR)) for reconstruction and the other part in the discussion. Does the “Northwest China” referring to NWAR or the whole?

A: Thank you for pointing out this confusion.

Upon careful consideration, because the study area is located in the eastern part of Northwest China, on the northwestern margin of the traditional Central Plains agricultural zone, its geographical extent involves three cardinal directions (“west”, “north”, and “east”), making it relatively complex to describe. Therefore, we have replaced the previously used “Northwest Agricultural Region of China (NWAR)” with a more intuitive designation: Shaanxi and Gansu Provinces in the Qing Dynasty, abbreviated as SG.

Second, “Northwest China” and the other part of “Northern Agricultural Region of ancient China (NAR)” should be clearly distinguished when use the records for drought reconstruction and make any statement on the analysis or the results. It is difficult for a reader to recognize a mentioned place whether belonged to Northwest China. For example, in the abstract, “droughts covered Zhili, Shanxi, Shaanxi, and Gansu provinces” and “bumper agricultural harvests in Henan, Shandong, Jiangsu, and Anhui provinces in 1759”. Some structure changes is necessary to make the “Northwest China” and the other part of “northern China” to be distinguished.

A: Thank you for pointing out this confusion.

Because the natural geographical distribution of drought often does not follow human administrative boundaries, in order to reconstruct the natural extent of the drought, our study area necessarily extended to provinces beyond Northwest China, such as Shaanxi, Zhili, and Henan. For the above reasons, the description of the study area in the original manuscript may indeed have caused confusion to readers. However, after revising according to your first comment (replacing “Northwest Agricultural Region of China (NWAR)” with “Shaanxi and Gansu Provinces in the Qing Dynasty (SG)”), the confusion you pointed out has been resolved.

Third, do “Northwest China” in line 68 and in lines 70-71 refer to the same area? At present, Northwest China does not include Qinghai Province, but the “the area east to Qinghai Lake in Qinghai Province was belonged to the Gansu Province. It is better to define the Northwest China using to the provinces in 1820(Fig. 1), and to list the corresponding provinces at present.

A: Comment accepted.

In the revised manuscript, we have explicitly stated: “The provincial boundaries of Gansu and Shaanxi Provinces as our study area differ from those of present-day Shaanxi and Gansu Provinces. We adopt the boundaries of Gansu and Shaanxi Provinces in 1820 from the Concise Historical Atlas of China (Tan, 1991) as the study area.” Thank you!

Forth, The measures out of NWAR in “4.1” is suggested to be deleted. For example, the “Cao rice” for Zhili in lines 334-338.

A: Comment accepted. The above-mentioned words have been deleted. Thank you!

Some other suggestions are as follows.

Figure1 should give a general name.

A: Thank you for pointing out this flaw.

We have titled Figure 1 as: Figure 1: Study area – Shaanxi and Gansu Provinces in the Qing Dynasty.

Line 68, “km2”?

A: Thank you for pointing out this error. We have corrected the citation.

Lines 90-91, “Records of Qing Dynasty” is for every emperor, but “Records of Qing Dynasty: Qianlong Biography (RQD) ” is only for Emperor Qianlong.

A: Thank you for pointing out this error. We have corrected the citation.

The above-mentioned mistake has been corrected as follows: “The first is the Records of Qing Dynasty (RQD).” Meanwhile, we have added the following sentence in the subsequent text: “The historical records we used are the entries from 1759 to 1760 in the RQD.”

Line 114, Qinling Mountains is an important of climate boundary. What kind of climate boundary is it to be.

A: Comment accepted.

The Qinling Mountains form the climatic boundary between the relatively humid subtropical monsoon climate to the south and the relatively dry temperate monsoon climate and temperate continental climate to the north. We have added this sentence in the appropriate place in the original text. Thank you!

Lines 129-130, “1759 was the worst year for agricultural harvests between 1730 and 1900”. It seems 1900 was the worst in Figure 3?

A: Thank you for pointing out this error. We have corrected the citation. The above-mentioned mistake has been corrected as “1759 was the worst year for agricultural harvests before 1900.”

Line 376, “occupied” should be “managed”.

A: Thank you for pointing out this error. We have corrected the citation.

Line 379, “wasteland” is “wild land”.

A: Thank you for pointing out this error. We have corrected the citation.

4.3 Long-term climate background and societal adaptation to climate disasters”. “and” is “of”?

A: Thank you for pointing out this error. We have corrected the citation.