

This manuscript presents new data on the heavy metals at 18 sampling points with 108 samples in the Lake Aha watershed, Southwest China. The authors interpret their heavy metals results by applying a couple of statistical techniques to better understand their data along with distribution, sources, controlling factors, and water quality for human consumption. Although the analysis and methods used are nothing new, I assume that this kind of study will continue in the future and this first compilation will be essential. As the quality of surface water is one of the most sensitive issues worldwide, this study will be of great importance not only at a local scale, but all over the world and the amount of data on a new river system is worthy of publication. However, there are some major and minor issues needed to be considered prior publication.

General Opinion and Comments:

In fact, the paper mostly deals with the heavy metals with some minor description of the pH and even minor of the EC and DO from abstract to conclusion. I recommend a more appropriate description of the physicochemical variables along with the heavy metals. Please follow following research as a reference: *Pant, R.R., Zhang, F., Rehman, F.U., Wang, G., Ye, M., Zeng, C., Tang, H., 2018. Spatiotemporal variations of hydrogeochemistry and its controlling factors in the Gandaki River Basin, Central Himalaya Nepal. Sci. Total Environ. 622–623, 770–782. <https://doi.org/10.1016/j.scitotenv.2017.12.063>*. Also, the authors did not acknowledge the importance of pH and EC for the abundance and distribution of heavy metals in the inflowing tributaries. Specify that these issues are within the scope of this study.

In addition, may be authors should explain better that in what basis they select the sampling points. Why only three sampling points from the Jinzhong River basin? It is not sufficient to show a map! In addition to how many points are selected, why you select these points is more important. In general, a higher description of the hydrology and climatology of the basins must be added (You may refer : *Zhang, F., Qaiser, F. ur R., Zeng, C., Pant, R.R., Wang, G., Zhang, H., Chen, D., 2019. Meltwater hydrochemistry at four glacial catchments in the headwater of Indus River. Environ. Sci. Pollut. Res. 26, 23645–23660. <https://doi.org/10.1007/s11356-019-05422-5>*).

Specific Comments:

1. The keywords are missing in the abstract. I recommend the authors to write 4-5 keywords, so that it would be easy for the future readers to find the relevancy of your work in their interest.
2. Line 28-29: What are these three distribution patterns here? The abstract should stand alone, so, please make abstract more precise.
3. You have mentioned in your text (line:171) that Mn and Sb have high values Chinese Standard i.e., > 1 , and in Line: 30, you have stated that all the hazard indexes are < 1 , it could be but you may highlight the previous sentence in the abstract.
4. Line 36: You have acknowledged medical wastes could be the reason for elevated concentrations of some of the heavy metals, however, there is no evidences in your entire manuscript about the same.
5. Line 39-46: Add some refences in the introduction part from the Third Pole Region and other parts of the world to give the general overview of the heavy metals in the world rivers.
For instance: *Qu, B., Paudyal, R., Pant, R.R., Qaiser, F.U.R., 2020. Inorganic components in river waters in the Third Pole, Water Quality in the Third Pole. <https://doi.org/10.1016/b978-0-12-816489-1.00004-9>; Pant, R.R., Zhang, F., Rehman, F.U., Koirala, M., Rijal, K., Maskey, R., 2019. Spatiotemporal characterization of dissolved trace elements in the Gandaki River, Central Himalaya Nepal. J. Hazard. Mater. 389, 121913. <https://doi.org/10.1016/j.jhazmat.2019.121913>*
6. Line 53-55: Not only the natural and anthropogenic sources heavy metals, but also mention their controlling factors. Also, when comparing the different results of hydrochemical variables, the authors have to consider the effect of discharge on DO, EC, pH and heavy metals.
7. Line 56-58: References to support this statement are required.
8. Line 77-79: Please give the discharge in all three inflowing tributaries.
9. Line 81: Maintain consistency throughout the manuscript e.g. write abbreviation of the Jinzhong River (JR), and after tha use the abbreviations throughout the test.
10. Line 99-104: I suggest to write the detection limits of the elements and quality control in

the laboratory including after how many days of sample collection , the laboratory analysis was conducted.

11. Line 105-113: In statistics, the consistency of data is fundamental: if the dataset is not adequate, the output of a statistical analysis is not significant. For example, are there any missing data? Please do clarify. In the same section, before applying the Pearson's correlation, did you test the normality of the dataset? I do not think the dataset are normal in this study. If data are not normal you have to use Spearman's correlation. Please, make sure and elaborate it.
12. Line 110-112: Also, mention eigen values for PCA e.g., > 1 or what? You may follow the following research for the same: *Pant, R.R., Zhang, F., Rehman, F.U., Wang, G., Ye, M., Zeng, C., Tang, H., 2018. Spatiotemporal variations of hydrogeochemistry and its controlling factors in the Gandaki River Basin, Central Himalaya Nepal. Sci. Total Environ. 622–623, 770–782. <https://doi.org/10.1016/j.scitotenv.2017.12.063>.*
13. Line 143-146: Cite appropriate references here, one of the references could be Rehman Qaisar, F.U., Zhang, F., Pant, R.R., Wang, G., Khan, S., Zeng, C., 2018. Spatial variation, source identification, and quality assessment of surface water geochemical composition in the Indus River Basin, Pakistan. *Environ. Sci. Pollut. Res.* 25, 12749–12763. <https://doi.org/10.1007/s11356-018-1519-z>
14. Line 154: I wonder the maximum DO values reported as 18.64 mg/L, my understanding is that the maximum value of DO that can be attained by a water body is around 14 mg/L or 14.6 mg/L at 0°C to be precise. Please make sure about it.
15. Line 173-175: If really there are some anthropogenic activities responsible for the elevated concentrations of the heavy metals, you need to specify them.

16. Line 225: Where are the acid coal mining locations? Do they correspond with elevated concentrations of EC and heavy metals; and low values of DO samples?
17. Line 187-194: Comparison with WHO and Chinese guidelines should be in more detail. You may specify for what variables it was closer to the recommended guideline and from which inflowing tributary
18. Line 230-238: I consider some of the statements are rather speculative. Elaborate the discussion with following reference: *Pant, R.R., Zhang, F., Rehman, F.U., Koirala, M., Rijal, K., Maskey, R., 2019. Spatiotemporal characterization of dissolved trace elements in the Gandaki River, Central Himalaya Nepal. J. Hazard. Mater. 389, 121913. <https://doi.org/10.1016/j.jhazmat.2019.121913>*
19. Line 240-246: Since the YR basin is dominated by agriculture land (>50%) and the highest WQI also reported from the same basin, so the elevated concentrations may also be linked with the agriculture activities. Are there any supporting evidences for this?
20. Figure 4: Please illustrate the standard deviation, you may refer following reference (Figures) for further clarification <https://doi.org/10.1016/j.jhazmat.2019.121913>

Thank you.