Hydrology and Earth System Sciences Discussions

Hydrol. Earth Syst. Sci. Discuss., author comment AC1
https://doi.org/10.5194/hess-2021-173-AC1, 2021
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Reply on RC1

Masoud Saatsaz and Aboulfazl Rezaie

Author comment on "Water Resources Management, Technology, and Culture in Ancient Iran" by Masoud Saatsaz and Aboulfazl Rezaie, Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2021-173-AC1, 2021

Date: 30.07.2021

Dear Reviewer,

We appreciated the time that you have taken in our manuscript and the constructive comments.

In this revised version of the manuscript, we have tried to do our best to address your comments. We have included many paragraphs in many parts of the manuscript to improve our contribution. A slight change has been made in the title to be more engaged with the body. We also tried to change titles and sub-titles to reflect our intentions and visions clearly. More specifically, we have rewritten some sections and added more information to enhance the quality.

In what follows, the comments and our replies are in simple text, respectively.

We hope this version will be considered positively for publication.

Thank you again for your consideration.

Sincerely,

Corresponding Author

Reviewer #1: comments

I appreciate the authors for their efforts to shed light on such an important subject, but their work has plenty of room for improvement.

- The article title is both ambitious and ambiguous. “Water Resources Management, Technology, and Culture in Ancient Iran” makes the readers expect to learn about an argument on a kind of relationship between technology and culture which has emanated from water resources management. However, throughout the article, the readers do not come across such reasoning in an attempt to prove that water resources management served as a historical context in which technology and culture intersected or interacted.

Answer: First of all, we would like to thank you for your high-quality reviews of our manuscript and your careful comments.

We agree with you. We think it was not necessary to cite the word "sources" in the title. We have tried to sort the terms "Technology, Management, and Culture" according to their engagement in the manuscript.

In this version, we have changed the article's title as follows:

Old title: Water Resources Management, Technology, and Culture in Ancient Iran

New title: Technology, Management, and Culture of Water in Ancient Iran

- *The topic "Historical Evolution of Life on the Iranian Plateau" does not correspond to the historical period of this study, but it's more of a short introduction that goes back to as early as 90000 years ago and then ends with the advent of agricultural communities in Iran. This topic could have been an introduction to the general history of Iran over the same period of time as that of this study, in view of water issues. This way, the readers could have gained a general knowledge that is a precursor to the next discussion. Talking about the migration of Homo Sapience into the Iranian plateau and the history of plant domestication shows little relevance to the main argument. Moreover, Rihel and his colleagues claim that the first farming communities appeared on the Iranian plateau even earlier than 7 or 8 millennia BC as follows: Rihel, S., Zeidi, M., & Conrad, N. J. (2013). The emergence of agriculture in the foothills of the Zagros mountains of Iran. Science, Vol. 341, 65-66.*

Answer: This section has been totally revised as follows:

Old version:

- **Historical Evolution of Life on the Iranian Plateau**

Living on the Iranian Plateau started with the dispersal of early modern humans from Africa, dated between at least □90,000 and □50,000 years ago in the Middle-Paleolithic of the Stone Age (Delson 2019). The oldest-known artifacts from the Middle-Paleolithic, such as stone tools, have been found at the Varvasi Cave (in Kermanshah), Yafteh Cave (around Khorramabad), Kashafrud (in Khorasan Razavi), and Ganj Par Site (in Rostam Abad, Gilan), signifying the human existence on the Iranian Plateau (Vigne et al., 2005). During the 8th and the 7th Millennium BC, the first agricultural communities started to emerge in southwestern, western, and northwestern Iran, where perennial rivers, rainfall, and fertile alluvial soils allowed agrarian societies to develop (Riehl et al., 2013). Meanwhile, the earliest animal domestication began to occur in the Taurus and Zagros Mountains (Zeder 2008; Helmer et al., 2005). Agriculture and domestication growth caused some community members to engage in off-farm activities such as construction, mining, woodworking, metalworking, trading, stone cutting, and other services. All of these components were essential for early civilizations to emerge (Mountjoy 2005).

New version:

- **The Water Significance in Prehistoric Iran**

Living on the Iranian Plateau started with the dispersal of early modern humans from Africa, dated between at least □90,000 and □50,000 years ago in the Middle-Paleolithic of the Stone Age (Delson 2019). The oldest-known artifacts

from the Middle-Paleolithic, such as stone tools, have been found at (i) the Varvasi Cave in the Dinurab River Basin , (ii) Yafteh Cave in the Khorramabad River Vally , (iii) Kashafrud Site along the Kashafrud River Basin , and (iv) Ganj Par Site around the Sefidrud River , signifying the human existence in water-rich regions of western and north of Iran (Vigne et al., 2005). During the 8th and the 7th Millennium BC, the earliest villages (e.g., Chogha Bonut , Ali Kosh , Ganj Dareh , and Teppe Sarab) early agricultural communities started to emerge in southwestern, western, and northwestern Iran, where perennial rivers, rainfall, and fertile alluvial soils allowed agrarian societies to develop (Alizadeh 2003; (Zeder and Hesse 2000; Riehl et al., 2013; Potts 2014; Gallego-Llorente et al., 2016). The sedentary lifestyle introduction resulted from wild plant gathering by the early Neolithic hunters and gathers. Meanwhile, the earliest animal domestication began to occur in the Taurus and Zagros Mountains (Zeder 2008; Helmer et al., 2005). In the early stage of domestication, nomadic pastoralism was practiced in southwestern Iran (Zeder and Hesse 2000; Misra 2009). Agriculture and domestication growth caused some community members to engage in off-farm activities such as construction, mining, woodworking, metalworking, trading, stone cutting, and other services. Indeed, it was during a period between 6500 and 3800 BC that core regions formed in Iran in the light of artificial water management, characterized by developing water canal networks and breaching levee-banks (Adams, 1965; Hole et al., 1987; Gillmore et al., 2009).

As you can see, many references have been added in the context from reliable sources to back up claims.

- *In the article, there are some contradictions and conceptual conflicts between some facts mentioned in the different parts of the article. Also, some controversial hypotheses are treated as definite proven facts. For example, on page 10, in the first paragraph, the authors contend that Islamization of water rules was impeded and stopped by some barriers, whereas immediately in the next paragraph they talk about the Islamic Sharia and its rulings about water issues. Also, on the same page, the authors take it for granted that qanat has been native to Iran and spread from Iran to its neighboring countries, though this subject is still controversial and it's very difficult to pinpoint any given area as the actual cradle of qanat system.*

Answer: in this version, we tried to remove the available contradictions in the manuscript. For example, about the qanat origin, we have changed this sentence as follows:

Old version:

Immediately after the arrival of Islam, Iran had a messy and disorganized environment. Muslims tried to change the religious, political, institutional, and social structure of the country. *The implementation of Islamic customsand lawswas one of the first steps towards the Islamization of society. In the meantime, water could be an essential link between custom, religion, law, and community, but there were obstacles problems in the Muslims' path.* In the sources of sharia, there were only some concepts such as justice, fairness, and balance, for the benefit of all societies (Naff 2009). Although the Quran has 63 references to water (Farshad and Zinck 1998), it does not assert any clear duty or rule on water supply and consumption (Absar 2013). The lack or insufficiency of fundamental rights and obligations regarding access to water, sanitation, sharing, and selling water was the main barrier to the Islamization of water-

related rules. As a case, Arab Muslims had no law or regulation about qanats because qanat was native to Iran and spread from Iran to neighboring countries.

New version:

Immediately after the arrival of Islam, Iran had a messy and disorganized environment. Muslims tried to change the religious, political, institutional, and social structure of the country. *In general cases, the implementation of Islamic customsand lawshad been considered as one of the first steps towards the Islamization of the society. However, there were obstacles in the Muslims' path to make changes in water-related fields. In the initial sources of sharia (e.g., Quran) ,* there were only some concepts such as justice, fairness, and balance, for the benefit of all societies (Naff 2009). Although the Quran has 63 references to water (Farshad and Zinck 1998), it does not assert any clear duty or rule on water supply and consumption (Absar 2013). As a case, Arab Muslims had no law or regulation about qanats because this system and its culture *was developed* in Iran and introduced subsequently to neighboring countries.

As you can see, most of these contradictions were due to improper selections of words that have changed the meaning of these sentences to something completely different from their intents.

- *The article needs more integration. The facts provided in the article are not very interrelated and interconnected.*

Answer: We have attempted to add sentences or paragraphs, improving logical flow in the manuscript body. Also, we have organized and changed all heading or subheading titles to separate distinct parts of the manuscript.

The article cannot come up with a novel fact, discovery or interpretation. The authors have done a great job to read through many sources and glean a valuable set of information, but all they say is in fact a different rehash of our previous knowledge. The article is not expected to produce new facts or present new discoveries from scratch, but at least it could abstract a novel historical pattern or suggest a new interpretation about a historical link between hydraulic technologies and Iranian culture, by juxtaposing those diverse historical facts.

We thank you for your appreciation of our work. About the research novelty, we tried to enter our interpretation and attitude in the body. Some parts of the article are totally novel. Some discussions about the relationship between water technology and culture (e.g., the role of water technology in holding Persian Norouz celebration) are not enough discussed in other researches. Our calculation about the impact of drought on the Persian communities that justifies the Achaemenid concerns about the drought or showing the role of water celebrations to encourage people to value, respect, and protect water (added in the new version) are completely original. We have attempted to add a conclusion section at the end of each section to explain our findings. Sometimes, we tried to provide a new vision for our readers by merging or adding more details. Also, it is too hard to find a similar case to compare. In the new version, we also have enhanced the conclusion by addressing our findings.

Please also note the supplement to this comment:
https://hess.copernicus.org/preprints/hess-2021-173/hess-2021-173-AC1-supplement.pdf