

Interactive comment on “Water erosion research in China: A review” by Haiyan Fang

Anonymous Referee #1

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This manuscript sets out to provide a review of the development of water erosion research in China over the past ca. 100 years. The documentation associated with the manuscript provided by the Editorial Office of HESS indicated that the manuscript is seen as a potential contribution to a Special Issue (SI) of HESS focussing on the ‘History of Hydrology’. As a reviewer, I am unsure if the Editors of the SI have provided contributors with guidelines on manuscript content, to which this contribution might be expected to conform. Equally, I am uncertain if the Editors of the SI have already judged the contribution to be suitable in general terms for inclusion in the SI. Against this background, I must indicate that I found the manuscript interesting and informative, but I am not convinced that it should be seen as meeting the requirements for a contribution to an SI dedicated to the ‘History of Hydrology’. I will elaborate my concerns further below.

As someone whose research has largely focussed on the field of erosion and sedi-

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ment transport, I see no problem in confirming that a contribution on this topic would be appropriate for inclusion in the SI. Although some might argue that research on soil conservation measures, which is included in the review, is marginal to the field of hydrology, I also feel that inclusion of this topic in the manuscript is appropriate. My main concern regarding this manuscript is the context in which it has been written. I feel that it is too inward looking for a manuscript destined for publication in a major international journal such as HESS. I would suggest that an international audience might be willing to accept that the coverage primarily relates to the history of water erosion research in China. However, I also feel that it is important that the coverage should place the developments and trends described into a broader international context. For example, I would expect to be told if the development of the water erosion research in China broadly mirrored that in other parts of the world, or whether it followed a different path in both its focus and its chronology. Related to this, I would expect some attempt to identify research areas where China might be argued to have been ahead of the game and to have contributed important advances to international work in the field. I could find little or no attempt to address these issues and this context. Looking more broadly at the attempt by the author to develop a chronology for the evolution of water erosion research in China, the author focuses primarily on the number of papers published over time. He identifies an initial stage extending from 1922 to 1980, a period of rapid development between 1981 and 2000 and a period of stability extending from 2001 to the present. I would suggest that any attempt to establish a chronology needs to take account of the broader socio-political environment within which this development was occurring and not simply the number of papers published. Important here is the extent to which there was free interchange of ideas both within the country and with the rest of the world or a rather different and perhaps essentially unique situation. I would suggest that the latter situation existed and that this represents a key feature of the history of water erosion research in China, particularly between the 1950s and 1970s. My understanding of the scene in China would suggest that in the 1950s the close links with the Soviet Union are likely to have exerted an important influence on the de-

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velopment of water erosion research, since at that time many Chinese scientists were trained in the Soviet Union. Subsequently, between the mid 1960s and the mid 1970s, the Cultural Revolution saw the near closure of the country to international exchange of scientific ideas, theory and methods, major disruption of the scientific community and its leadership, cessation of publication of scientific journals and lack of access to foreign journals. In the early 1980s contact with the international community was re-established. I have doubtless oversimplified the situation, but it would seem essential to incorporate consideration of this background into any history of erosion research in China. I would suggest that the existence of a situation where international interchange was highly restricted during the Cultural Revolution provides an interesting opportunity to identify contrasts between developments in China and in other areas of the world and to assess the impact of a period of enforced isolation. Conversely, in more recent times, it should be possible to identify particular areas of erosion research in which China arguably led the world both in terms of scientific endeavour and the existence of unique environments that have facilitated work in particular research areas. . A further related area which I feel has been given too little consideration is the organization of the scientific community responsible for water erosion research and possible contrasts with other areas of the world. Probably because of contacts with the Soviet Union and its Academy of Sciences, it would seem that Academia Sinica and its research institutes became an important driver of scientific research. Did the establishment of large research institutes coupled with large River Basin Conservancy Commissions (such as the YRCC) influence the development of water erosion research? Did the subsequent expansion of research into the Universities, where individuals were perhaps more influential and had greater possibilities to innovate, introduce change and exert a significant influence on the subsequent development of water erosion research? Again, I may have oversimplified or wrongly interpreted the situation in China, but it seems likely that some of these issues and influences have been important for the history of water erosion research in China. In a field such as water erosion research, the background of the researchers can also exert a significant influence on the direction

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and emphasis of research. Engineers will have a different approach to soil scientists and geographers and geomorphologists will again often have a different perspective. It would be interesting and useful to consider the influence of this factor in the development of water erosion research in China. Related to this, I was surprised and indeed disappointed to find little or no attempt to identify individuals who have made important contributions to the development of water erosion research in China. I feel sure that in most countries such persons are recognised. Why not in China? One name that I would have expected to find would be Ning Chien (Qian Ning) but I did not find an explicit reference to his important contribution, although his work is cited twice. In a similar context the fact that publications authored or co-authored by the author of this manuscript in recent years (since 2007) represent almost 10% of the references cited in a review spanning ca. 100 years could be seen as unexpected.

Looking in more detail at the content of the manuscript, I have a number of more specific observations which are indicated below.

(1) The title of this manuscript does not include the word history. This may be because this was not seen by the author to be an overarching and essential element of the manuscript. However, it seems that this is the primary focus of the SI to which this manuscript is seen as a potential contribution. In this context, I feel that the manuscript places insufficient emphasis on this historical perspective. Section 2 of the manuscript does provide some indication of the history or chronology of the development of water erosion research in China. It identifies three periods. However Section 3, which accounts for about 50% of the manuscript, focusses on achievements. It highlights 6 areas, which are considered in turn with little attempt to link them or, more importantly, to provide an overarching historical perspective. For example, sediment source tracing and fingerprinting is introduced as one of the achievements with no explicit discussion of its place in the evolution of water erosion studies or how it links to earlier and current developments of the subject area and changing information needs. I should indicate in passing that I was surprised not to see reference to the important review of source

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tracing studies in China produced in 2019 by Tang et al. (2019).

(2) I would also suggest that the coverage of the 6 areas highlighted in Section 3 is somewhat unbalanced. The treatment of the achievements related to global change (Section 3.5) and to the role of sediment as a pollutant and as a vector for the transport of nutrients and contaminants (Section 3.6.2) could be seen as very limited in scope in view of the importance of these topics for the international scene and contemporary research activity.

(3) Any attempt to review developments in a field of research, such as that provided here, inevitable faces problems in referring to a large number of studies without the text becoming little more than a list. In places, this manuscript suffers from this problem. Page 3 of the manuscript illustrates this. There is a need to achieve a balance between providing a narrative and overloading the text with numerous examples.

(4) I would suggest that there is scope to extend the analysis presented in Figure 3 to compare the trends associated with publications in Chinese and those published in English.

(5) It is arguable whether it is appropriate to include Section 4 dealing with Research Needs in a manuscript destined as a contribution to an SI focussed on 'The History of Hydrology'.

(6) I found the manuscript relatively easy to read and free of major errors in grammar and syntax. However, if the manuscript, or a revised version, does proceed to publication, I feel that there will be a need to undertake careful editing to 'polish' the English and avoid errors. Use of a professional editing service is probably required here. A few examples of the text requiring such attention are provided below. (a) Line 82 I presume that this should read 'Ansai' rather than 'Ansi? (b) Line 86 'Loess' not 'Loss' (c) Line 142 I think that a different word than 'stable' is required, If something is developing it is arguably not stable. (d) As indicated above, Page 3 provides an example of overemphasis on lists. (e) Line 192 The meaning of the heading for Section 3.2

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'Erosion Processes and Variation Mechanisms' is not clear.

Recommendation: In short, I am far from convinced that this manuscript represents a suitable contribution for an SI dedicated to 'The History of Hydrology'. I also feel that many of the limitations that I have identified also apply to a review of developments in water erosion research in China. A more explicit international perspective is required if it is to be published in an international journal. The coverage also needs to be more balanced between different areas of the subject.

Reference: Tang, Q., Fu, B., Wen, A., Zhang, X., He, X., Collins, A., 2019. Fingerprinting the sources of water-mobilized sediment threatening agricultural and water resource sustainability: Progress, challenges and prospects in China. *Science China Earth Sciences*, 62(12), 2017-2030. <https://doi.org/10.1007/s11430-018-9349-0>.

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