Hydrol. Earth Syst. Sci. Discuss., 11, C760–C765, 2014
www.hydrol-earth-syst-sci-discuss.net/11/C760/2014/

Hydrology and Earth System Sciences
Open Access
Discussions

Interactive comment on "A review of droughts in the African continent: a geospatial and long-term perspective" *by* I. Masih et al.

Anonymous Referee #1

Received and published: 2 April 2014

GENERAL COMMENTS

This manuscript presents a literature review of several aspects of droughts in Africa with a primary focus on the description of the main events and their related impacts. The manuscript is well organized and written. It presents a nice summary of the current status of droughts in Africa and makes useful suggestions for the future.
On the other hand, I would expect that this kind of reviews provide a large scale picture that is not already evident or at least some connections between the topics should be presented. Sometimes the review of literature is too specific and makes it hard to follow the main argument, maybe the discussion of the generic aspects of the papers reviewed could be enhanced.

For instance in section 3.3 most of the time is dedicated to teleconections between ENSO and little or nothing to shifts in ITCZ, monsoon, the Tropical Easterly Jet (TEJ) or the intertropical front (ITF). I think that this section that is called “causes of droughts” will be benefited with a broader discussion of physical processes that can led to droughts in Africa (Just to cite a few papers Janicot et al., 1998; Nicholson 2000, Rouault and Richard 2005). I know that no review is going to be complete, but if the authors want to keep a discussion on the causes of droughts its necessary a more in deep analysis.

Therefore I think that this article can serve as a starting point of many future drought research in the continent. While the manuscript is generally in a good shape, I do feel that the manuscript can be improved by addressing a few comments below.

SPECIFIC COMMENTS

Page 2682 Line 25: droughts occur more frequently in Africa compared to the other continents? As it is I don’t fully agree with this statement. The fact that droughts cause more impacts is because the societies there are more vulnerable but not necessary because droughts are more frequent. Please, rephrase or add any reference that can support this affirmation.

Page 2683 L3: What is a mega-drought? A multi-year drought? Please define it briefly.

Page 2684 L15-19: This paragraph is vague and a bit confusing. There are statements related to an impact database (EM-DAT) and literature of the development of some drought related indicators. What is the clear message that the authors want to give here? I suggest to be more specific here as is not clear if the authors want

HESSD
11, C760–C765, 2014

to refer to the development of the drought indicators or to the available datasets. Regarding to the information available at the moment there are specific continental drought monitoring and forecasting systems that deals with specific drought related information in real time as well as historical data: The African drought monitor: http://hydrology.princeton.edu/adm (Sheffield et al., 2013) and the DEWFORA African drought observatory http://edo.jrc.ec.europa.eu/dewfora/ (Barbosa et al., 2013).

Page 2684 L25: Causes of what? Aridity or droughts?

Page 2685 L15: What kind of variability are referring here? Spatial or temporal? This affirmation comes from Figure 1 or from the literature review?

Pages 2685 L25 to 2686 L9: Quite big change of argument here. In the previous paragraph the authors made a description of some generalities of precipitation regime in Africa and in this paragraph a review of the vulnerability is presented. This paragraph could fit better in the discussion presented in section 3.1 where the affirmation that semi-arid and sub-humid regions are more drought-prone and vulnerable and can be supported with tables 2 and 3.

Page 2686 L 20-22: Only one drought indicator is presented (SPEI) in the paper. At least a short discussion on the ability of other indicators to detect droughts in the continent should be necessary for a review paper.

Page 2687 L6-8: I don't see the need to define and restrict the definition of drought to only meteorological aspects in a review paper. It means that papers relating to agricultural, hydrological or socio-economic aspects of droughts were not included? I don't think that this is the case, however if this is the intention of the authors I would suggest to clearly state that the review is focused in meteorological aspects.

HESSD

11, C760–C765, 2014

Page 2688 L 28-29 and Figures 2 and 3: It's not clear how Figures 2 and 3 can support the argument of the increase of drought severity and frequency. There are presented some cases and is hard to agree with this conclusion form there. How reliable are the datasets used to compute the SPEI in the first part of the twenty century?

Page 2691 L 1-2: What it means that the droughts were not anomalous? How the monsoon generated more severe and prolonged droughts? Please explain or rephrase.

Page 2692 L3-4: The use of the word predicted in this context is not completely accurate. The results showed are a result of climate projections that represents the potential future evolution of the variables. Projections are distinguished from predictions as the first involve several assumptions (as future socioeconomic and technological developments) that may or may not be realised, and are therefore subject to significant uncertainty. Consider changing it with "projected" or similar.

Page 2692 L8-9: Consider rephrasing the first sentence of the section. It's not clear the message that come out from there.

Page 2692 L15-18: The statements in this sentences are quite vague and are not adding substantial information. Consider deleting or rephrasing them.

Page 2693 L 17-22: The main argument exposed here is the relationship between lower summer rainfall and changes in surface sea temperature in the Atlantic and Indic Ocean. Then the sentence that links El Niño events with deterioration of vegetation is hard to follow. Consider to elaborate more this point trying to link it with the Atlantic and Indian Oceans' arguments.

HESSD
11, C760–C765, 2014

Page 2694 L9: high frequency of what? Droughts? Vulnerability to droughts is not related with drought frequency but with the potential damage that a drought can give to a determined socio-economic system.

Page 2695 L10-16: The structure of this paragraph can be improved.

Page 2695 Last sentence: Even if I found the paper interesting, I don't see clearly how it can be used for long-term drought planning or as a guide for re-align policies, neither didn't I see any proposal to do so. This issues are particularly complex and aren't covered in this review. I recommend to delete this sentence or add substantial evidence in the paper that can support this affirmation.

Technical corrections

Page 2689 L6: "For instance, number of severe. . ." should read "For instance, a number of severe"

References:

Barbosa, P., Naumann, G., Valentini, L., Vogt, J., Dutra, E., Magni, D., and De Jager, A.: A Pan-African map viewer for drought monitoring and forecasting, 14th Waternet Symposium, Dar es Salaam, Tanzania, 30 October to 1 November 2013.
Janicot, S., Harzallah, A., Fontaine, B., Moron, V.: West African Monsoon Dynamics and Eastern Equatorial Atlantic and Pacific SST Anomalies (1970–88). Journal of Climate, 11(8), 1998.
Nicholson, S. E.: The nature of rainfall variability over Africa on time scales of decades to millenia. Global and planetary change, 26(1), 137-158, 2000.
Sheffield, Justin, et al. "A Drought Monitoring and Forecasting System for Sub-Sahara African Water Resources and Food Security." Bulletin of the American Meteorological Society, 2013.

HESSD
11, C760–C765, 2014

Rouault, M., Richard, Y.: Intensity and spatial extent of droughts in southern Africa. Geophysical Research Letters, 32(15), 2005.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 2679, 2014.