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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Assessing floods and droughts in the Mékrou River Basin (West Africa): A combined household survey and climatic trends analysis approach" *by* Vasileios Markantonis et al.

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<General comments>

My expertise allows me to evaluate only the parts of this paper that concern the socioeconomic survey. My assessments and comments about this paper, which are shown below, are solely based on how the authors perform the survey and discuss its results. A positive aspect of this paper is the methodological novelty that it puts together original survey data in West Africa and discusses them in combination with scientific climate data. However, in the current version of the paper, methods, data and results of the survey are poorly described and presented. I also doubt that the authors have

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taken full advantage of the results to support their arguments. Below are the specific problems I find in the current version of the paper.

'Response: We thank the Referee for the positive evaluation of the novelty of our work and for the constructive comments that will help us to improve our manuscript. '

<Specific comments>

- Descriptions of survey methods are incomplete. First, it says that the survey targeted 30 villages in three countries, but it is not clear on what criteria these villages were chosen. Do they constitute all the villages in the study region, or are they a sub-sample of the villages? If the latter is the case, how are they selected? Do they have similar geographical characteristics (elevation, vegetation, soil types, local weather conditions, etc.), or different ones? Second, how the number of surveyed households is determined for each village. Is the number proportional to the village population or not? How large is the population of each village in the first place? Third, to prove randomness of sample selection, exact methods of selecting households in each village need to be specified. Did the authors make a full list of households for each village and randomly picked up households from the list, or did they use any other methods? In the latter case, how did they warrant randomness of sampling? Fourth, was the questionnaire conducted in an in-person interview or through mail? If the former is the case, were the interviews conducted in French only or supplemented with information in a local language(s), and is there any possibility that such a linguistic choice could affect responses? Finally, response rates and summary statistics need to be presented.

'Response: We agree that the whole survey approach was not fully described in the submitted version of the paper: the revised version will be shaped to address all the issues mentioned by the Referee, providing all the details. Villages and towns were selected to include a geographically representative sample of the study area: a small river basin shared by 3 countries. The selection process was designed to keep a balance among urban and rural settlements. The number of households was selected

proportionally to the total population of each selected village or town. Households were selected randomly, in spatial terms, and not from a list since there was no list available. Interviews were conducted in person by a team of Master students supervised by a professor for each of the countries. The students received a training before starting the survey: in this session, the questionnaire was explained and discussed with them. Since the area is francophone, all the material used was written in French. The students conducting the interview, however, were local: this aspect should have allowed to overcome any eventual language issue. Response rates and all the requested statistics will be provided. '

- The authors would need some more analysis on the exact reasons of why perceptions of flood and drought occurrence differ across respondents. Do they reflect differences in locations of households, differences in affluence and lifestyle of households, differences in psychological biases across respondents, or simply the accuracy of responses? In particular, I suspect that detailed locational data of households have already been collected through the survey, and that it is possible to verify if differences in self-assessed occurrence of floods and droughts could be explained by differences in local weather and topological conditions or reflects other factors.

'Response: We thank the Referee for this useful comment. Conducting our analysis, we tested the relation between flood and drought perception and lifestyle or behavioral characteristics. This test, however, did not highlight any statistically significant relation. On the other hand, significant differences were highlighted in relation with the location of the households. We will revise the manuscript to analytically present and discuss these results.'

- The authors mention that obtaining cost estimates of floods and droughts from the respondents has been difficult. In such a case, they should at least show the percentages of valid responses for the three countries, including Burkina Faso. Also, the authors would need to add some more discussions of what the cost numbers given by the respondents may really represent (costs could mean many things: asset loss, re-

pair/ resettlement costs, loss in wage and employment, loss in agricultural production, opportunity costs of labor time, medical costs, etc.) and of how accurate they are.

'Response: The revised manuscript will provide more information on the response rate and valid responses about the section of the survey concerning flood and drought cost estimates. However, due to the low responses and the vague information provided, we are afraid that, basing on the available data, we could not further analyze in detail the breakdown of the floods/drought impact categories. In the revise manuscript, we will further comment the existing literature and the data collected to better highlight these aspects.'

- Provided that estimated per-household costs of floods and droughts are credible to some extent, it may as well be useful to calculate the total costs of floods and droughts in the region, by using the information of the total number of households and of average household characteristics in the region.

'Response: Aggregating the cost of extreme events considering total population and number of households in the area was one of the goals we aimed to achieve with the survey and the analysis presented in this manuscript. However, the limited response rate of the section of the survey referring to the cost of extreme events at household level, in our opinion, would not be enough to provide a robust estimation of the total cost of droughts and floods in the area. In the revised version of the paper, we will analyze and discuss this aspect in more details.'

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