

- 1. The scientific methods used to compile the information are valid. However, they should be more clearly outlined on regard to the instruments implemented to gather the information.**

The methodology describes how interviews were carried out and what subjects were covered by the interviewers. Interviews were coded according to standard methodologies. We have added to the methodology section an additional paragraph (see below) on the data analysis.

“Qualitative data analysis throughout was conducted using the same codes, which emerged from the dataset itself. The data were coded in two stages, with an initial stage to identify codes across the dataset and then a subsequent recoding using the finalised codes. The final analyses are organised below by scale, focussing first on national-level, then sub-national level and then community level.”

- 2. The references quality and number are appropriate. However, there are multiple sentences on the paper that lack a reference, misleading the reader to believe that they correspond to original contributions of the authors. The authors should include some references to support some of the most relevant affirmations of the paper, especially in the Introduction and Literature review sections.**

Reviewer 1 provided specific requests for references in supplementary material – see later addressed comments for added references.

- 3. All the information contained in the Literature Review section is really interesting and reflects a good research work. However, the section is some way extensive, reason why I suggest to reduce the length of it. That will give more predominance to your own research results.**

The following text has been removed from the literature review section (slight edits to make the remaining text continue to make sense have also been made – edits can be seen in tracked changes of manuscript):

“EWS have been developed for both natural and anthropogenic hazards, with many countries now having warning systems in place for terrorist incidents, cyberattacks and other complex events as well as for floods, heatwaves and other extreme weather events (Glantz, 2003). Developed nations are typically dependent on multiple systems with varying degrees of complexity. However, in the developing world, there are also significant development challenges that can make uptake of early warnings challenging because people lack the resources to act on received warnings.”

“Europe is particularly well developed in water-based hazard warning systems (Alfieri et al., 2012; Pappenberger et al., 2008), following the Water Framework Directive in 2000 and the Flood Directive in 2007. The European approach incorporates prevention, protection, preparedness, emergency response and recovery and lessons learned. Many European systems are based on numerical weather predictions, and have access to substantial computational power (Alfieri et al., 2012).”

“Cools et al. (2016) and (Mustafa et al., 2015) discuss case studies of EWS from Belgium, Egypt, Mali and Pakistan, emphasising the importance and benefits of involving community level actors in the design of the EWS, noting that effective EWS may be very simple.”

“showed that early warnings in Bangladesh played an important role in empowering actors at community level to develop local disaster mitigation plans: access to information can have a role in enabling people to act. They further emphasise”

“. For example, many hydrological and meteorological services in Europe make their forecasts available online in multiple formats, for examples see Cools et al., 2016, and offer Opt-in alert services using, for example SMS messages. Other systems broadcast to community members”

“They may also struggle to know what to do if the message does not include instructions.”

“A common issue with the communication of warnings is the perception by scientists and decision-makers that the public are likely to “panic” or to react in undesirable ways (Schelfaut et al., 2011). Studies suggest, however, that this is not the case and that engagement at community level is vital (Basher, 2006; Cools et al., 2016; Schelfaut et al., 2011).”

“For the communication of risk to the public, a very large body of literature exists (e.g. see review in Kellens et al. (2013)). Some studies have found that false alarms can be problematic in eroding trust (Donovan et al., 2017; Fakhruddin et al., 2015), but that they are manageable with good communication strategies before the crisis, whilst Mileti and Sorensen label these as “myths” in understandings of early warning (i.e. that people will panic, or perceptions of the impacts of false alarms).”

“Studies in Europe and USA have discussed the challenge of getting individuals to decide to evacuate based on a warning: people often wait to consult others or to hear an additional message (on the radio or television, for example) before taking action (Parker et al., 2009; (Huang et al., 2016; Lindell, 2013).”

- 4. The language is fluent and precise. The manuscript structure is clear, although it will be benefit with some content reduction in some sections.**

Literature Review section has been reduced substantially (see point 3).

- 5. Regarding the title, it does not clearly reflect the content of the paper. I would suggest to include a verb related to the action of the research (i.e. analysis, evaluation) and also to include the hazard, since this is quite specific in the research.**

Title changed to:

Communicating complex forecasts: An analysis of the approach in Nepal’s Flood Early Warning System

- 6. The results section will be benefit if you include some graphics to facilitate the comprehension of the results by the reader.**

See specific line edits below (points 9-28).

- 7. Since there are multiple concepts of what EWS means (some authors use the concept of EWS, early warning, warning systems, monitoring systems, interchangeably, as if they were the same concept) in some parts of the manuscript is difficult to understand to what concept the authors refer to. For this reason, the authors should state at the beginning of**

**the manuscript what EWS means to them, and then lead the discussion considering the difference between the concept that the authors selected and the concept other authors use.**

The following text has been added at the end of the introduction:

“In this paper, early warning systems or EWS will refer to an integrated system that includes processes such as monitoring, forecasting and prediction, dissemination and communication, and response activities that take place before a hazard occurs. Early warning will refer to the specific issuance of a warning message or warning information.”

The use of EWS, early warning systems, and early warning terminology has been checked and edited throughout the paper to ensure it corresponds with these definitions.

**8. I would be also necessary to include the concept of “Complex Forecast”.**

Line 39 edited to read:

“More complex EWS, supported by multiple complex forecasts including probabilistic forecasts and forecasts at different spatial and temporal scales, can provide additional lead time, allowing community members, responders, and high level decision-makers additional time to prepare in advance of a flood event.”

**9. [line25] I suggest to add a couple of references to support this affirmation**

References inserted:

UNISDR, Global Assessment of Risk 2015, available at <https://www.preventionweb.net/english/hyogo/gar/2015/en/home/index.html>, last access 12 November 2018, 2015.

Budimir, M., Brown, S., and Dugar, S.: Communicating risk information and early warnings: bridging the gap between science and practice, Youth Science-Policy Interface Publication: Special Edition. Disaster Risk Reduction: a road of opportunities, 13-18, <https://www.preventionweb.net/go/53923>, 2017.

**10. [line 27] this should also be supported with references**

References inserted (Kelman and Glantz, 2014 added to reference list):

Kelman, I., and Glantz, M.: Early Warning Systems Defined. In Reducing Disaster: Early Warning Systems For Climate Change, edited by Singh, A., and Zommers, Z., 89–108. Dordrecht: Springer Netherlands, [https://doi.org/10.1007/978-94-017-8598-3\\_5](https://doi.org/10.1007/978-94-017-8598-3_5), 2014.

Budimir, M., Brown, S., and Dugar, S.: Communicating risk information and early warnings: bridging the gap between science and practice, Youth Science-Policy Interface Publication: Special Edition. Disaster Risk Reduction: a road of opportunities, 13-18, <https://www.preventionweb.net/go/53923>, 2017.

**11. [line 65] add references to support this**

Reference inserted:

UNISDR, Developing Early Warning Systems: A Checklist, available at <http://www.unisdr.org/2006/ppew/info-resources/ewc3/checklist/English.pdf>, last access 12 November 2018, 2006.

**12. [line 81] Seems like you mean that people-centred EWS do not involve complex monitoring and forecast instrumentation. In the literature several authors tend to confuss this concept, eventhough UN clearly defines people centred EWS. Since there are many different concepts on what EWS means, you should state at the beggining of your paper what EWS means to you and then develop the paper from there**

Sentence changed to:

“In the developing world, there are fewer examples of operational FEWS than developed countries, and they tend to be less dependent on computing power, more often low-tech systems managed by the community throughout the development and provision of the warnings.”

**13. [line 90] Not only on developing contexts, but also on develop ones.**

Sentence changed to:

“In both developed and developing contexts efforts are being made in integrating scientific and social information for early warning systems.”

**14. [line 96-97] please check the wording of this sentence**

Sentence changed to:

“EWS need to be effective across all four elements, and across diverse communities and needs; they need to be careful not to neglect elements of dissemination, communication, and response capability.”

**15. [line 103] maybe you mean trust in the source of the warning, or the actor in charge of communicating the warning**

Sentence changed to:

“Credibility or trust in the actor issuing the warning influences action, so the selection of dissemination channel and format is important (Budimir et al., 2017).”

**16. [line 108] for example reiterative**

Sentence cut to reduce length of Literature Review.

**17. [line 110] I would suggest to include additional references**

Reference added:

Practical Action, Flood Early Warning Systems in Practice: experiences of Nepal, Practical Action, Kathmandu, Nepal, 2016.

**18. [line 113] Include reference of an example and [line 114] include reference with example**

Sentence changed to:

“Thus, while some countries communicate early warnings directly from a scientific institution to the public (e.g. via a meteorological office in the UK: [www.metoffice.gov.uk](http://www.metoffice.gov.uk)), others communicate via a civil defence mechanism (e.g. national landslide early warning in Italy; Segoni et al., 2018) or a local government office (Samaddar et al., 2012).”

References added:

Samaddar, S., Misra, B., and Tatano, H.: Flood Risk Awareness and Preparedness: The Role of Trust in Information Sources, in 2012 IEEE International Conference on Systems, Man, and Cybernetics (SMC), 3099–3104, Seoul, Korea (South): IEEE, <https://doi.org/10.1109/ICSMC.2012.6378267>, 2012.

Segoni, S., Rosi, A., Fanti, R., Gallucci, A., Monni, A., and Casagli, N.: A Regional-Scale Landslide Warning System Based on 20 Years of Operational Experience, *Water* 10, no. 10, 1297, <https://doi.org/10.3390/w10101297>, 2018.

**19. [line 139] This paragraph could be integrated to the previous one**

Previous paragraph deleted to reduce length of Literature Review. But paragraph joined with previous one still remaining in text as covering similar topic.

**20. [line 199] I suggest to add a more recent reference**

Changed from MoHA 2009 to Practical Action 2016.

**21. [line 207] Include the cite or mention of Figure 1**

Figure 1 cited.

**22. [line 240] Include reference**

Reference to Practical Action (2016) inserted.

**23. [line 244-248] This paragraph is repetitive. Youn could merge it with the previous one**

Paragraph merged with previous paragraph and repetition of list of NGOs removed.

**24. [line 250-251] you could merge this with the next paragraph**

Paragraph merged with next paragraph.

**25. [line 279] Include the reference of the documents where you take from this information**

Reference inserted:

Uprety, M.: Moving towards Forecast Based Flood Preparedness in Nepal: Linking Science of Predictions to Preparedness Actions, Piloting Forecast Based Financing (FbF) In Nepal, 10.13140/RG.2.2.21044.71043, 2018.

**26. [line 290] Include reference**

Reference inserted: Practical Action, 2016.

**27. [line 292] There is not Appendix in this version so please make sure that the final version includes it. Or include it as a reference and provide the link so the readers can access to it**

Appendix references deleted.

Link to Nepal DHM website with bulletins inserted: (see [www.hydrology.gov.np](http://www.hydrology.gov.np))

**28. [line 310] Provide reference, or state if the source of the information in verbal**

Reference inserted within text: (personal communication, July 2017).

**29. [line 328] This and the following paragraph are more related to the previous section (Innovations in dissemination ) than to this one**

Two paragraphs on Common Alerting Protocols moved to end of previous section on innovations in dissemination.

**30. [line 343] All the instruments (questions for the interviews and questionnaires) should be available for the reader. You could include a link for downloading the documents or to include a couple of lines inviting the reader to write the authors and ask for them**

The lead author's email address is included in the paper. Readers can request questionnaires via email.

**31. [line 367] Define this acronym DEOC**

District Emergency Operation Centre inserted.

**32. [line 379] Briefly described how the questionnaires were distributed among the population**

Edited to:

“Answers to qualitative and quantitative questionnaires were collected by research assistants using random sampling from 127 individuals at community level in East (Jhapa District), West (Bardiya and Kailali Districts) and Central (Nawalparasi District) Nepal.”

**33. [line 387] I suggest to present this information in graphics in order to facilitate the analysis by the reader**

There is a lot of wide ranging information provided in this paragraph that would end up being very confusing trying to incorporate into a graphical image. The authors suggest leaving this as text rather than converting into a confusing graphic.

**34. [line 448] avoid redundancy**

Changed to: “particularly to inform certain industries,”

**35. [line 518] Would be good to include bar graphics with the main results in order to facilitate comprehension by the reader**

The results in this section are drawn from discrete answers to over 50 questions at national and district level and over 30 questions at community level, as well as open-ended answers and workshop discussions. Presenting the results in one graphic is likely to be too confusing to a reader, and choosing only one result to prioritise over others is likely to either over simplify the results or falsely present some results as more important than others. If the editors have suggestions for specific results to be pulled out of the data, the authors can do so. However, the authors suggest no additional graphics are created.

**36. [line 630 onwards] use italics in all the quotes**

All quotes edited to italics.

**37. [line 674] double space**

Not a double space – justified paragraph presents illusion of extra space.

**38. [line 705] Clarify why this is included among the Community sample**

Sentence edited to:

“A local representative of Lutheran World Relief mentioned relying on DHM’s SMS system (in addition to the bulletin), but noted that there are some issues with the reliability of the mobile phones in practice.”

**39. [line 744] Most of the content of this and previous sections are more related to monitoring and forecast, than to risk knowledge. It would help if you have a way to develop a short paragraph regarding the risk knowledge and the perceived risk**

New section on Risk Knowledge added (and numbering of sections edited). Text added:

“There is substantial awareness at national and district level of the Bulletin as a source of information. There still remain barriers to national and district level stakeholders using the wide variety of forecast information available in the public domain, including a lack of awareness of the information, and difficulty understanding and interpreting the technical information for decision-making. However, the focus should be to improve the Bulletin to help these non-technical decision makers to better understand and take action, rather than prioritising significant investment in improving their understanding of the range of forecast and supplementary information available.”

**40. [line 918] The conclusions are good, but they will improve a lot if you could include two more short sentences with the main results of the application of the interviews and questionnaires. The conclusions are quite general at the moment, you need to make them more directly related to your research**

Following text added:

“...This research reviewed the availability and utilisation of these complex forecasts in Nepal, their integration into dissemination and decision support tools, and considered their impact on improving early action to increase the resilience of vulnerable communities to flooding. Results from this research suggest that...”

**41. [figure 1] I suggest to use two different levels for the legend; one for the catchments and a second for the basin. You could also use different color scale in order to facilitate comprehension from the reader**

In this image catchments and basins are the same thing. I have edited the figure so that these labels are no longer confusing.

**42. [figure 2] more than risk communication, I would say that this is the warning chain**

Title changed to:

“Early warning communication chain including telemetry system and actors (in grey) (from Gurung, 2016)”

**43. [figure 7] I suggest to include the categories for Likelihood and Potential Impacts inside the figure. This way the image will be clear and there will be no need to write this in the caption**

Figure edited. New caption reads:

Figure 7. The flood risk matrix that is used across England, Scotland, and Wales to communicate the likelihood and potential impacts of flooding. Source: Flood Forecasting Centre.