Natural Hazards
and Earth System
Sciences
Discussions

Interactive comment on "Community Based Early
Warning Systems for flood risk mitigation in
Nepal" *by* P. J. Smith et al.

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Received and published: 12 May 2016

This is an interesting paper in the application of probabilistic forecasting for flood early warning in Nepal. There is an existing community-based early warning system in the area, using an upstream gauge observation to provide an early warning of imminent flooding, but the need for a longer lead time forecast motivates the authors to pursue a probabilistic model-based approach.

This work has clear merit and is within the focus of the journal, though I would ask the authors to improve on how the two distinct sections (development of community-based early warning systems, and development of the probabilistic flood forecast) link together, especially given how moving from a deterministic to probabilistic approach will clearly influence how the early warning system is set-up.

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Recommendations:

1) Sections 1&2 are quite general. I believe it would be beneficial to the paper for these sections to be more focussed on the case-study catchment, situating this information within the wider context of resilience building and flood hazard in Nepal where relevant.

2) Figure 1 is also quite general – I recommend editing it to highlight the case-study catchment, along with the location of the rain and river gauges. I'm not sure whether it is deliberate or just due to NHESS formatting, but the Figures should be included as close to where they are relevant as possible.

3) Table 1 includes information on minimum data requirements for the application of the methodology. It would be interesting in Sections 3.1.1-3.1.3 if there could be some discussion of the minimum requirements for each of these components for establishing a community-based early warning system.

4) Depending on the target audience of this paper, the flow of the text could perhaps be improved by moving Section 4.1 to a Supplementary Information file, and providing a summary for a lay-person. The important message for a practitioner is perhaps that this model is available via an R package and GUI, and can be applied to anywhere where there is gauged data? In some ways having an overly technical explanation might hinder the uptake of the model for future applications!

5) For Table 1, are these the minimum data requirements for the calibration period of the model, or for both the calibration and evaluation periods?

6) I feel that there is a section missing on how these newly-developed probabilistic forecasts can be applied. The forecast provides the probability of exceeding a warning threshold. Section 3.1 describes aspects such as dissemination and communication, and response capability. How has the CBEWS had to be adapted to enable decisions to be made from probabilistic forecasts? Has the community received training in probabilistic forecasts, or have procedures been put in place so that the community can

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follow them without needing to interpret the probability themselves? Answering these kind of questions would be really valuable to the academic and practitioner communities working on Early Warning Systems.

7) The conclusion would benefit from some additional discussion on the wider context of the work carried out.What are the key messages for the development of probabilistic forecasts / CBEWS elsewhere? Could the methodology be easily applied elsewhere? Would it achieve the same increase in warning lead-time? (Presumably dependent on catchment size and driver of flood?)

Specific Comments

P1L14: I think in this context you mean 'populus' (n) not 'populous' (adj)

P1L24: Regional not region

P2L5: At this point it would be helpful to define what a Community Based Early Warning System is.

Fig2: It would be helpful if Fig1 showed where the gauges are located.

P4L27: Could the map in Fig1 also show the location of the other Practical Action CBEWS projects?

P5L3: Could there be a brief description of what a Community Risk Assessment involves? Who leads these assessments? How are they carried out?

3.1.3 to 3.1.4: This is touched upon slightly; there are clear procedures to follow, what is done to ensure that these procedures are followed? Is anyone held accountable if they are not?

P7L8: Why did it fail? (and later, perhaps discuss/ comment on if the model-based methodology would have continued to work in this situation)

P13L19: 'the' 2014 flood

P13L23: therefore

P13L26: either 'the' or 'a' selection