

## ***Interactive comment on “An integrated methodology to develop a standard for landslide early warning system” by T. F. Fathani et al.***

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The authors would like to thank the Referee RC1 for his/her valuable comments. We believe this comment will be able to improve the scientific value of this manuscript. We will improve the writing of the manuscript according to the technical comments and will try hard to be able to address all the points in the specific comments as following:

Language: The authors agree and will improve the writing of the manuscript.

Introduction: The authors will improve the content of the Introduction section. We will refer to the references suggested by the referee and others regarding LEWS.

Scale: The authors will mention in the revision on this system is should be implemented for local scale/single landslide.

C1

Universality: The authors will rewrite the sections regarding the conditions where this system will be applicable.

Evacuation map: Perhaps it is not clear in the manuscript but the evacuation map was made based on the result of discussion by the local people. The discussion process was led by a facilitator and need to comply with the basic guidelines as written in the manuscript and should be very simple and easily understood by the local people. We will add this information in the revision.

Warning levels: Number of warning levels is depending on the results of public consultation with the local community. In some pilot areas, the locals decide to have “green level” as the lowest level. Key activities during “green level” are (1) regular coordination between the disaster preparedness and response team and (2) regular check of the monitoring and warning devices. However, at most of pilot areas, the community decided to have “caution” as the lowest level. The authors will revise the manuscript to add more explanation about this “green level”.

Legal aspects: The authors agree with the referee’s comment. The only legal aspect in this system is that the importance of local government commitment to the implementation of LEWS in their region. We should clarify this point in the manuscript.

Figure 2: The trained officer role is to conduct a visual ground check on the monitoring equipment and warning device in order to identify if false warning happens (shown in dotted line). On the other hand, the trained officer might identify an obvious landslide movement in the field, but the equipment has a technical error to record the symptom. As shown in Fig. 2, there are three paths to issue the warning: (1) local control center; (2) local authority; (3) real-time interface by pushing the button by authorized officer. The author will revise the manuscript to elaborate the issuance of warning as being suggested by the referee.

Installation of monitoring equipment: Yes, we will clarify that in the revision of our manuscript.

C2

Warning based on rain gauge measurement: Yes, it is a big challenge for the implementation of warning based rain gauge measurement. Some pilot areas used the thresholds suggested by previous researchers or the thresholds developed at other similar geological conditions. And we agree with the referee that there are so many options to determine a threshold. However this manuscript does not deal with the determination of the thresholds as warning criteria. In order to implement this system, the experts will have to decide which option will be used depending on the monitoring data availability. The manuscript will be revised to elaborate this issue.

Determination of warning threshold (not rainfall threshold?) by experts: Yes, we definitely agree with the referee. In fact, at all pilot areas, the disaster preparedness and response team has been involved in this. The acceptance of false/missed alarms is one of the key success of this system. The manuscript will be revised accordingly.

Figure 1: The authors agree with the suggestion by the referee. Figure 1 will be revised accordingly.

Technical corrections: The authors agree with the referee and will revise the manuscript based on the suggestions.

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