

# **GAPS AND SHORTCOMINGS OF THE EARLY WARNING SYSTEM AND COMMUNITY RESPONSES: A CASE STUDY OF KOSLANDA, MEERIYABEDDE LANDSLIDE IN BADULLA DISTRICT**

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## **Introduction**

An Early Warning System (EWS) needs to actively involve the communities at risk, facilitate public education and awareness of risks, effectively disseminate alerts and warnings and ensure that there is a constant state of preparedness. The EWS enters into the Disaster Management Cycle in the pre-disaster phase and continues even through to the post-disaster phase. In Sri Lanka, the early warning is issued for different disasters through the Disaster Management Centre (DMC) along with other technical agencies. National Building Research Organization (NBRO) is the authority responsible for landslide risk monitoring. On the 29<sup>th</sup> of October, 2014 at around 7.15 am an enormous landslide occurred in Koslanda, Meeriyabedda tea plantation estate in the Haldumulla DS division of Badulla district causing considerable damage to life and property. District officials received an early warning stating that the area was in danger, but those warnings were not effectively passed on to the villagers. This type of failure demonstrates the need for improved landslide early warning dissemination system in order to reduce the risks and to protect human lives (Benni, 2012). The main objectives of this study were to identify the gaps and shortcomings (1) of the institutional early warning system and (2) in community responses.

## **Methodology**

Primary data was collected through interviews via questionnaire surveys, observations and other field based retrieval techniques in 2015. Secondary data was collected from published documents, websites as well as by interviewing government officials of related authorities. The analyses have been done with the aid of analytical software such as Geographical Information Systems, Remote Sensing, Google images, Excel and Minitab. The household sample of the study was randomly

selected as a representative sample of 50% of the directly affected families of the Meeriyabedda Tea Plantation Estate.

### **Results and discussion**

The Meeriyabedda landslide was mainly triggered by the second inter-monsoonal rain which occurred in October 2014. More than 500 mm rainfall was recorded at the Poonagala rain gauge from 26<sup>th</sup> to 29<sup>th</sup> October 2014. 79 families with 271 people were directly affected by the landslide. Affected communities were temporarily relocated at several locations such as schools and the Poonagala Hindu Kovil.

With respect to the **institutional EWS**, the NBRO had issued warnings to the DMC and relevant organizations on 27<sup>th</sup> of October 2014. But the evacuation warning was not issued by the NBRO. The most serious shortcoming of the EWS observed here is that the warning issued by NBRO is at the District or Divisional Secretariat division. Therefore the early warning dissemination at the community level becomes less practical. An awareness programme was conducted by Red Cross and Red Crescent Society with the support of DMC and NBRO in the Kotabakma GN division in 2009 but only 1 out of 40 survey respondents had attended this programme. This respondent observed that the Kovil, which was identified as being the safe location in the awareness programme, was among the first to be affected by the landslide.

In the case of the Meeriyabedda landslide many institutional gaps and shortcomings were observed. NBRO has still not covered the hazard mapping at the Divisional and Districts level. Lack of disaster related knowledge among government officials was evident. The damage and loss estimation records by various government authorities are different from each other.

With respect to the **community responses**, the first warning to the estate community was issued by NBRO in 2005. The community was asked to relocate to another safer place. But due to several reasons people were reluctant to leave their homes. 8% of the respondents said that they do not have safer places to move to, 27% stated that income sources will decrease if they move elsewhere and 33% said that they do not have enough money to build a new house and their income will also be

reduced. In addition to economic reasons, the villagers hesitated to leave their homes due to a socio-cultural attachment to their native place. This is similar to the “sense of place” concept (Thuan, 1977).

Another serious shortcoming in community response is the lack of respect for warnings. The rain gauge at Meeriyabedda has not been used for many years. Several villagers have observed some cracks on the land as well as in some buildings before the landslide.

An Institutional and Community Response Early Warning Design (ICREWD) should be introduced to minimize the landslide impact. ICREWD can issue three stages of landslide warnings.

**Stage 1:** When rainfall exceeds 75 mm per/day a slight increase of ground water level may occur and hill slope will show slight changes. The instrument (Tilt-meter or Extensometer) installed at the top of the hill will record this change and send a message through its vibrating wire to the alarm system installed at the bottom of the hill. But in this stage the alarm is not activated because the change occurred is not enough to initiate a landslide.

**Stage 2:** When rainfall exceeds 100 mm per/day, the hill slope creates some cracks which may appear on the surface. The instrument will send the recorded measurement to the alarm system and the alarm will be activated with medium sound level, notifying the nearby communities to evacuate.

**Stage 3:** When rainfall exceeds 120 mm/day, the risk of landslide is severe. Then a high volume alarm sound will be issued as an evacuation warning.

### **Conclusion**

Many gaps and shortcomings in the Early Warning System have been identified. The dissemination of early warning from Divisional level to the community level must be initiated. Intensive and effective awareness programmes need to be conducted among the communities by responsible authorities. Roles and responsibilities of the officers involved in the emergency operation in disaster management must be improved. Socio-economic and cultural factors must also be considered during the resettlement process and the resettlement guidelines must be improved. The most vulnerable places identified by NBRO must be covered by

hazard and risk mapping as soon as possible. ICREWD should be introduced to minimize the landslide impact in vulnerable communities in Sri Lanka.

### **References**

Benni, T. 2012. Landslide Analysis and Early Warning Systems: Local and Regional Case Study in the Swabian Alb, Germany: Springer-Verlag Berlin Heidelberg.

Thuan, Yi Fu., 1977, Space and Place the Perspective of Experience. <http://danm.ucsc.edu/~dustin/library/tuan%20space%20and%20place.pdf>.