

**GOVERNMENT OF INDIA  
WATER RESOURCES, RIVER DEVELOPMENT AND GANAGA REJUVENATION  
LOK SABHA**

UNSTARRED QUESTION NO:2018  
ANSWERED ON:04.12.2014  
CWC MODEL  
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**Will the Minister of WATER RESOURCES, RIVER DEVELOPMENT AND GANAGA REJUVENATION be pleased to state:**

- (a) whether Central Water Commission (CWC) is developing a mathematical model to find out and estimate the losses suffered due to landslide in Himalayas and hilly States; and if so, the details thereof;
- (b) whether any step has been taken to adopt any special modern technique or develop mechanism to forewarn about cloud burst and landslide in hilly areas; and
- (c) if so, the details thereof?

**Answer**

THE MINISTER OF STATE FOR WATER RESOURCES, RIVER DEVELOPMENT AND GANGA REJUVENATION (PROF. SANWAR LAL JAT)

(a) Central Water Commissioner (CWC) is not developing any mathematical model to find out and estimate the losses suffered due to landslide in Himalayas and hilly States.

(b) & (c) Geological Survey of India (GSI) has informed that it had carried out some research-based investigations in the Nilgiris, Tamil Nadu and in the Darjeeling Himalayas between 2007 and 2011 in collaboration with the Faculty of Geosciences and Earth Observation (ITC), Netherlands. Both the research projects were about landslide susceptibility, hazard and quantitative loss estimation or landslide risk analysis.

CWC simulates the spread of flood waves using mathematical models in case of imminent breach of artificial dam created in a river due to landslide.

Regarding Cloud burst, the India Meteorological Department (IMD) has informed that cloud burst is manifestation of very severe thunder cloud with intense localized and short lived precipitation due to very high instability in the atmosphere. Such intense convective cloud is generally associated with meso-scale systems. As such, there are limitations in monitoring cloud burst specifically over remote area and to predict the cloud burst events either through Numerical Weather Prediction

(NWP) models or by other methods of forecasting, mainly owing to their very nature of being highly localized and short lived.

However, with the advancements in the instrumentation and augmentation of observational network under modernization programme specially the Doppler Weather Radars the IMD is attempting NOWCASTING (prediction, few hours in advance) of the weather events. In addition, IMD has developed techniques and capability for forewarn very heavy rainfall events.