Editor (Prof. Joshua West)'s comments:

We are thankful to Prof. J. West for his insightful comments and suggestions that improved the manuscript in its final version. We have updated the MS as per the suggestions of Editor. Further, some queries of Editor are addressed below;

Comment 1: (Sec 4.4) I agree with the reviewer that it would help in a place like this to clarify a bit more in terms of observations of existing landslides vs. model predictions.

Response:
We acknowledge the necessity of validation of the proposed approach, as also brought up by the reviewer 2 in the comment 5 (In our response to reviewers).

As stated in the response, we have validated some of our predictive sites with the field observations in the study area where damming has already occurred in the past. Sedimentological analysis by other researchers has confirmed the landslide damming events in the geological past at the region containing our predictive sites (Sharma et al. 2017). This approach has also been applied recently at already dammed (partially) site where we predicted complete blockade of the river and consequent damage to the nearby bridge in case of further failure (Kumar et al. 2019a). As predicted, further failure blocked the river and damaged the bridges (https://timesofindia.indiatimes.com/city/shimla/nh-5-remains-blocked-due-to-landslides-in-himachal-pradesh/articleshow/74613645.cms, retrieved on 24th Dec. 2020).

Though we have provided the field examples, we cannot deny the significance of multiple case studies involving the existing damming sites, as suggested by the reviewer. However, it will require the back analysis of the following parameters to apply our proposed approach;

- Back analysis of the damming volume to reconstruct the landslide volume. As mentioned in the response of the Comment 2 (Reviewer 2), there are several uncertain spatio-temporal factors that play crucial role between landslide volume and dam volume. Exact response of these factors can't be ascertained at present.
- Back analysis of the failed slope topography to reconstruct the pre-failure slope stability model. It will require the adjustment of landslide area (not the volume because we have performed 2D analysis). Such readjustment of the landslide area to pre-failure state will also include uncertainty because there might be many episodes of failures (which are not dated/recorded) that resulted in final topography. Regional faults/lineaments also affect the slope topography and thus during slope topography reconstruction, lack of inclusion of this factor will surely affect the reconstruction.

  Nonetheless, in view of the Editor's suggestions, we plan to overcome this research gap in the future prospects.

Comment 2 (Sec 5.0): I am surprised by this statement, since I expect this region (with rapid exhumation) to have steeper slopes.

Response: We agree with the Editor's remark regarding the relationship of rapid exhumation and steeper slopes in the Higher Himalaya Crystalline (HHC) region. However, the statement in the MS intends to avoid such generalization in the HHC because the landslides (S.N. 7,14,15) are different in type and situated in different parts of the HHC.

The HHC region in the study area is found to possess two sub-regions that can be classified on the basis of lithology, climate, Normalized Difference Vegetation Index (NDVI), landslide type, and geomorphology (Kumar et al. 2019b).

The northern part comprises migmatitic gneiss and lies in the proximity of the SD (normal fault), whereas the southern part belongs to kyanite-sillimanite gneiss in the equal vicinity of the SD and MCT (thrust fault). These sub-regions also experience a spatial transition of climate from semi-humid (southern part) to semi-arid (northern part). This climatic transition is supported by the NDVI variation as it changes from 0.6 to 0.4 from the MCT to SD, respectively. The northern region comprises mainly bedrock landslides (rockfall, rock avalanche), whereas the southern region is dominated by the debris slides. The S.N. 7 is a rock avalanche type landslide, situated in the northern part of the HHC, whereas S.N. 14, 15 are debris slides that are situated in the southern part of the HHC. The northern region coexists with narrow, deep gorges and high topographic relief, whereas the southern region belongs to relatively wide valley and orographic frontal position that imply towards relatively more weathering in southern part of the HHC.

Comment 3 (Sec 5.0): What about slopes that may be unstable under heavy rainfall or seismic shaking, but have not yet failed, or where failures are not visible because vegetation has re-grown?

Response: This question comprises two scenarios; (1) slope that may be unstable under heavy rainfall or seismic shaking, but have not yet failed, and (2) slopes where failures are not visible because vegetation has re-grown.

The first scenario is perhaps difficult to comprehend at present because it is subjected to time and uncertain triggering events (rainfall or seismic shaking). Since the hillslopes in such region are always subjected to the weathering process that varies spatio-temporally, it might be difficult to identify such slopes until any visible failure signs (cracks and/or movement of loose material) occurs. However, we would like to explore this aspect using the combination of InSAR and numerical simulation in the future prospects.

The second scenario belongs to the possibility of vegetation growth on the failed slopes. Though the field visits were performed in different seasons to eliminate such possibility, this scenario might exist, particularly in the Lesser Himalaya Crystalline (LHC) and Lesser Himalaya Sequence (LHS). However, the landslides in the LHC and LHS are mostly rockfall/rock avalanche type because of the deep gorge setting, whereas the vegetation growth generally requires the debris laden hillslopes. Nevertheless, a statement in the 'Discussion' (Sec 5.0) has been mentioned about such a possibility to be covered in the future research prospects. The Higher Himalaya Crystalline (HHC) and the Tethyan Sequence (TS) region are subjected to the semi-humid to semi-arid climate and hence the vegetation type is mostly scattered trees/shrubs. Therefore, the second scenario might not be applicable here.

Comment 4 (Fig. 8)**:** Perhaps explain here that events in the instability domain are not expected to form landslide dams?

Response: We would like to mention that the instability domain pertains to the 'durability' of the dams that have (or will) form in case of slope failure. As shown in Fig. 8a, there are five landslides that may form the landslide dams (in Formation domain) and twenty-four landslides, which will not form (Non-formation domain). Later, instability domain (Fig. 8b) highlights the 'durability' of those dams that will form. As observed in Fig. 8b, there is only one landslide (S.N.5) that too in the uncertain domain (between stability and instability). It implies that if it (S.N.5) forms a landslide dam, the dam might be stable or unstable depending upon the current river discharge, slope gradient, and landslide volume. Remaining landslides that are predicted to form the dams (SN. 7,14,15,19) belong to instability that means the resultant dams would not be durable. Similar explanations are mentioned in detail in Sec. 4.2 and 5.0.