Briefing note on landslide risk maps

Introduction

A team of researchers from Durham University in the UK and NSET-Nepal have been mapping the landslides triggered by the 2015 earthquakes and the subsequent monsoons. To do this, we have used satellite images (photos of the ground taken from space). These give us a birds-eye view of the landscape and enable us to see how the landslides are changing over time. Satellite images are very useful but they only tell part of the story. It is essential that we combine this information with local expert knowledge – including the day-to-day observations of residents.

Below is a summary of what the maps show and how the map should be used.

Explanation of the map

- The **purple areas** on the map show landslides that were visible in satellite imagery as of November 2019. Some landslides may be missing. This is because:
    - Some landslides are too small to see from satellites (e.g. single rockfalls)
    - Some landslides are hard to see (e.g. because they are under trees)
    - Some landslides may be very new and have been triggered since mapping was completed
    - Some landslides may have stabilised or healed

- The **small circles** on the map show the locations of individual houses.

- The **colours on the circles** show the **relative risk** of each house being impacted by a landslide from the hillside above.
    - Relative risk is calculated by considering how landslide material **could** move downhill in the future, most probably during or after rainfall.
    - Importantly, relative risk **does NOT tell us the likelihood of a house being hit by a landslide in future**. Rather, it is an **indication of areas where something COULD happen**.

- The highest relative risk value is 1; the lowest relative risk value is 0 (zero). These values are represented by the colours on the circles:
    - **Red circles** show houses where the **relative landslide risk is highest**;
    - **Orange circles** show houses where the relative risk is **moderate**;
    - **Yellow circles** show houses where the relative risk is **low**;
    - **White circles** show houses where there is **negligible risk** from existing landslides.

- **Coloured stars** show houses which have already been impacted by a landslide, or are within 30 m of a landslide.

- **Triangles** show the approximate locations of NRA geohazard sites that were assessed prior to September 2018:
    - **Red triangles** show **Category 3** communities
    - **Orange triangles** show **Category 2** communities

- Importantly, the map shows the risk posed by **current landslides only**. They do not show the locations at risk from future landslides in areas that are currently stable.

How the maps should be used:

The maps should be used:

- **To identify areas and houses at risk of further disruption from landslides**
  - It should be expected that houses with the highest relative landslide risk (red circles) will be exposed to disruption from landsliding. For these locations, it is essential that residents are made aware of the risk, the options for risk management, and who to talk to for advice.
  - Areas and houses that are very close to, and particularly downslope of, existing landslides are at risk of further disruption. Identifying and communicating these at risk locations to the palika, ward chairs, and the residents is important so that mitigation or temporary relocation options during the monsoon can be explored.

- **To show how levels of relative risk vary within NRA-assessed Category 2 and Category 3 settlements**
  - The NRA Geohazards Assessment provided a single risk category for all households in a given settlement.
  - However, within a single settlement there are often higher and lower risk areas. Indeed, relative landslide risk can vary between houses, and over very short distances. As little as 15 m can separate houses that are at higher relative risk from those at lower relative risk.
  - The landslide maps can be used to identify houses, or groups of houses, within a given settlement at higher relative risk.

Note: The maps should **NOT** be used to estimate the likelihood of a landslide impacting a single location or within a certain period of time. For example, a relative risk of 0.5 for a house **DOES NOT** mean that there is a 50% chance that the house will be affected by landsliding. Instead, it simply means that the chance of being affected is higher than that for a house with a relative risk below 0.5.

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