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Rapid Offline-Online Post-Disaster Landslide Mapping Tool: A case study from Nepal

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One of the crucial components of post disaster management is the efficient mapping of impacted areas. Here we present a tool designed to map landslides and affected objects after the earthquakes of 2015 in Nepal as well as for intense rainfall impact. Because internet is not available in many rural areas of Nepal, we developed an offline-online prototype based on Open-Source WebGIS technologies to make data on hazard impacts, including damaged infrastructure, landslides or flooding events available to authorities and the general public. This mobile application was designed as a low-cost, rapid and participatory method for recording impacts from hazard events. It is possible to record such events offline and upload them through a server, where internet connection is available. This application allows user authentication, image capturing, and information collation such as geolocation, event description, interactive mapping and finally storing all the data in the server for further analysis and visualisation. This application can be accessed by a mobile phone (Android) or a tablet as a hybrid version for both offline and online versions. The offline version has an interactive-offline map function which allows users to upload satellites image in order to improve ground truthing interpretation. After geolocation, the user can start mapping and then save recorded data into Geojson-TXT files that can be easily uploaded to the server whenever internet is available. This prototype was tested specifically for a rapid assessment of landslides and relevant land use characteristics such as roads, forest area, rivers in the Phewa Lake watershed near Pokhara, Nepal where a large number landslides were activated or reactivated after the 2015 monsoon season. More than 60 landslides were recorded during two days of field trip. Besides, it is possible to use this application for any other kind of hazard event like flood, avalanche, etc.

Keywords: Offline, Online, Open source, WebGIS, Android, Post-Disaster, Landslide mapping