An Offline-Online Android Application for Hazard Event Mapping Using WebGIS Open Source Technologies

Roya Olyazadeh (1), Michel Jaboyedoff (1), Karen Sudmeier-Rieux (1), Marc-Henri Derron (1), and Sanjaya Devkota (2)

(1) University of Lausanne, ISTE - Institut des Sciences de la Terre, Faculté des géosciences et de l'environnement, Lausanne, Switzerland (roya.olyazadeh@unil.ch), (2) Department of Civil Engineering, Institute of Engineering, Tribhuvan University, Kathmandu, Nepal

Nowadays, Free and Open Source Software (FOSS) plays an important role in better understanding and managing disaster risk reduction around the world. National and local government, NGOs and other stakeholders are increasingly seeking and producing data on hazards. Most of the hazard event inventories and land use mapping are based on remote sensing data, with little ground truthing, creating difficulties depending on the terrain and accessibility. Open Source WebGIS tools offer an opportunity for quicker and easier ground truthing of critical areas in order to analyse hazard patterns and triggering factors. This study presents a secure mobile-map application for hazard event mapping using Open Source WebGIS technologies such as Postgres database, Postgis, Leaflet, Cordova and Phonegap. The objectives of this prototype are:
1. An Offline-Online android mobile application with advanced Geospatial visualisation;
2. Easy Collection and storage of events information applied services;
3. Centralized data storage with accessibility by all the service (smartphone, standard web browser);
4. Improving data management by using active participation in hazard event mapping and storage.

This application has been implemented as a low-cost, rapid and participatory method for recording impacts from hazard events and includes geolocation (GPS data and Internet), visualizing maps with overlay of satellite images, viewing uploaded images and events as cluster points, drawing and adding event information. The data can be recorded in offline (Android device) or online version (all browsers) and consequently uploaded through the server whenever internet is available. All the events and records can be visualized by an administrator and made public after approval. Different user levels can be defined to access the data for communicating the information. This application was tested for landslides in post-earthquake Nepal but can be used for any other type of hazards such as flood, avalanche, etc.

Keywords: Offline, Online, WebGIS Open source, Android, Hazard Event Mapping