



Geovisualization of Forest Dynamics via Mobile GIS

Chen Wang (1), Alessandro Gimona (2), and Yang Jiang (3)

(1) The James Hutton Institute, Aberdeen, United Kingdom (chen.wang@hutton.ac.uk), (2) The James Hutton Institute, Aberdeen, United Kingdom (Alessandro.Gimona@hutton.ac.uk), (3) Robert Gordon University, Aberdeen, United Kingdom (y.jiang2@rgu.ac.uk)

Community based monitoring have covered a wide range of applications, ranging from forest condition survey, natural disaster assessment and public health surveillance [1,2,3]. There are many arguments that lack of data to study how ecosystems work is an issue. Compared with traditional data analysis through printed questionnaires, we propose a new method for forest data collections by use of mobile devices. It is implemented through combination of ODK (an open-source set of tools) and Google Earth which allows data of ecosystem services and data collected on the ground to be viewed in Google Maps with their locations. ODK tools include the function of Questionnaire/Survey information, mobile data collection, data aggregation, and geospatial data display. The collected data can be used to integrated with other data set and remote sensing information.

We have tested the mobile application in Tyrebagger and Countesswells forests which contain different woodland types. Useful date related to tree species have been collected. Georeferenced ground photographs have been taken which are used to help validate land-cover and soil maps. Filled electronic forms have been sent to ODK server for analysis and aggregation. Geographic data has been presented on custom maps, visualized through bar graph and pie chart, annotated by Google Earth. The findings have potential implications for the monitoring and assessment of woodland to increase the effectiveness of their use, and contribution to wider forest management. This has the potential to significantly change forest monitoring system which can provide local communities with information on indicators of forest loss, changing land-use practices and socioeconomic realities.

1. Z. A. Rajput, S. Mbugua, D. Amadi, V. Chepngeno, J. J. Saleem, Y. Anokwa, C. Hartung, G. Borriello, B. W. Mamlin, S. K. Ndege, and M. C. Were, "Evaluation of an Android-based mHealth system for population surveillance in developing countries," *Journal of the American Medical Informatics Association*, vol. 19, no. 4, pp. 655–659, Feb. 2012.

2. Gardner-Stephen P, Bettison A, Challans R, Lakeman J, Malossane T, Wallis C, Lloyd M, Caldicott E and Gardner-Stephen D, "Succinct data: Extreme compression for ODK forms making digital field assessment practical during disasters by minimizing data transmission size and costs", *IEEE Global Humanitarian Technology Conference*, 2014

3. Pra, Pratihast, A.K.; Souza Jr., C.M.; Herold, M.; Ribbe, L. "Application of mobile devices for community based forest monitoring", *Proceedings of the Workshop Sensing a Changing World*, Wageningen, 9-11 May 2012.