Multicriteria analysis using open-source data and software for the implementation of a centralized biomedical waste management system in a developing country (Guinea, Conakry).

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In the last decade the increasing interest for public health has promoted specific regulations for the transport, storage, transformation and/or elimination of potentially toxic waste. A special concern should focus on the effective management of biomedical waste, due to the environmental and health risk associated with them. The first stage for the effective management these waste includes the selection of the best sites for the location of facilities for its storage and/or elimination. Best-site selection is accomplished by means of multi-criteria decision analyses (MCDA) that aim to minimize the social and environmental impact, and to maximize management efficiency. In this work we presented a methodology that uses open-source software and data to analyze the best location for the implantation of a centralized waste management system in a developing country (Guinea, Conakry). We applied an analytical hierarchy process (AHP) using different thematic layers such as land use (derived from up-to-date Sentinel 2 remote sensing images), soil type, distance and type of roads, hydrography, distance to dense populated areas, etc. Land-use data were derived from up-to-date Sentinel 2 remote sensing images, whereas roads and hydrography were obtained from the Open Street Map database and latter validated with administrative data. We performed the AHP analysis with the aid of QGIS open-software Geospatial Information System. This methodology is very effective for developing countries as it uses open-source software and data for the MCDA analysis, thus reducing costs in these first stages of the integrated analysis.