

## Review of remote sensing and geospatial technologies in estimating rooftop rainwater harvesting (RRWH) quality

### ABSTRACT

Rooftop rainwater harvesting (RRWH) systems can provide low-cost decentralized water to urban and rural households that have no access to treated water. These systems are considered the key strategic adoption measures for communities affected by climate change. Roofing materials, roofing conditions, roofing geometry, weather conditions, and land use/land cover (LULC) conditions can significantly affect the quality of RRWH. Therefore, the effects of these factors on RRWH quality must be analyzed carefully. Remote sensing and Geographical Information System (GIS) have been widely used in urban environmental analysis. However, these technologies have never been used to analyze, map, and model the effect of various factors on RRWH quality. This review determines the research gaps in the use of geospatial technologies in estimating RRWH quality and simulate the implications of roofing materials and roofing surface conditions towards the urban environment. An approach for the integrated use of remote sensing and GIS to assess the quality of RRWH is also proposed.

**Keyword:** Roofing materials; Roofing conditions; Spatial modeling; Environmental impact; Remote sensing; GIS