

Using Google Earth Engine to Classify Home Garden Land Use Class in Sri Lanka

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With advancements in data sources, software, and image analysis techniques, remote sensing has become an efficient method for forest classification. However, access to this technology has been limited for developing countries due to the high cost of high-resolution images and analysis software. A potential solution is that NASA and the European Space Agency provide free access to mid-low resolution satellite images. In addition, Google Earth Engine, a free cloud-based geospatial analysis platform, has allowed researchers from developing countries to conduct research without relying on costly remote sensing software. This study evaluates the suitability of the freely available images and the Google Earth Engine platform for agroforestry applications in Sri Lanka. Home garden is an agroforestry class seen in tropical countries often overshadowed by global land cover classifications. As the home garden structure and composition differs slightly from other forestry classes, it was necessary to investigate the variables to distinguish the home garden from other agroforestry classes. This study used a random forest classification algorithm to classify the home garden, utilizing terrain data and Sentinel-2A images as the dataset. The results confirmed that the red band of Sentinel-2 and textural metrics derived from grey-level co-occurrence matrix analysis are effective in identifying home gardens from other forestry classes. This research demonstrates that Google Earth Engine and the freely available mid-low resolution satellite images make the application of remote sensing in Sri Lanka a viable solution for the monitoring and mapping of land cover.

Keywords: *Google earth engine, Grey-level co-occurrence matrix, Home garden, Remote sensing, Sentinel*