

## Detecting Urban Expansion Trends in Weligama Urban Council using Remote Sensing and GIS

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The extensive history goes back to urban development, and human convinced build-up area and urban spreading through the specific region is one of the most important areas of human-induced urban expansion. Due to the unplanned urban expansion, Urban sprawl is a prominent issue in the cities nowadays. In today's world, these have become important topics in many scientific fields. This study probes the expansion of the 13 GN divisions in the Weligama urban council area. The main objective of this research is to find the urban land expansion index (SI). Remote sensing and GIS (Geographical Information Science) provide some methods for finding the expansion index using satellite imagery. Satellite images were used in 2005, 2010, 2015, and 2020 as primary sources taken by USGS earth explore. By using the NDBI (Normalized Difference Built-up Index) extract the built-up area and then the urban expansion index/sprawling index (SI) were calculated to identify the expansion of the study area. Finally, the maps of expansion of the built-up areas were prepared in Weligama urban council area to identify the urban expansion index. Considering such context for the town planning, it is better to use the expansion and sprawl analysis method to determine the extension patterns to create sustainable development. As per the results, the region has slightly expanded between 2005 and 2010, but between 2010 to 2015 and 2020 it takes a moderate speed for expanding the Weligama urban council area. Consequently, the final output shows that the urban expansion has happened along the beachside to the city center area.

**Keywords:** *remote sensing, GIS, NDBI (Normalized Difference Built-up Index), SI (Sprawling Index/ Urban Expansion Index), urban sprawl*