

Spatial Pattern of Urban Expansion and Green Spaces: A Case Study of Tangalle Area, Sri Lanka

PAMT Rupathunga^{1#}, NV Wickramathilaka¹ and PAT Hansamal¹

¹*Department of Spatial Sciences, General Sir John Kotelawala Defence University,
Sri Lanka*

#36-sps-0019@kdu.ac.lk

Urbanisation responds to urban expansion and changes in green spaces. Moreover, urban expansion has a significant impact on urban management. Urban forests (Green Spaces) provide benefits of the natural environment to communities. Recognising the spatial pattern of urban expansion and green spaces within a certain time period is vital for urban planning. This study examines the expansion in Tangalle town. Built-up expansion has occurred in recent years because of the tourism industry in this study area. The remote sensing indices, Normalised Difference Built-up Index (NDBI) and Normalised Difference Vegetation Index (NDVI) have been used to extract built-up and green spaces for identifying the spatial pattern changes from the years 1990 to 2021. According to the results of the urban expansion/sprawl index, urban areas been expanded slightly between the years 1990 and 2000, but it has decreased between the years 2000 and 2010. However, between 2010, and 2021, the urban area has sharply expanded up to 13%. The study revealed that the built-up area has increased enormously. NDVI shows that the increase in this built-up area has led to a decrease in significant agricultural lands and open spaces. Thus, in the year 1990, the urban form was an isolated urban pattern and it gradually became a cluster-based pattern. According to the urban expansion results, the urbanisation is expanding towards the northern direction from the city center.

Keywords: *urban spatial pattern, Normalised Difference Building Index (NDBI), Normalised Difference Vegetation Index (NDVI)*