UNRAVELING THE DYNAMICS OF URBAN AGGLOMERATION AND SPATIAL FORMATION IN THE COLOMBO DISTRICT

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ABSTRACT- Urban agglomerations are vital drivers of national and global economic development, with cities closely interconnected within them. The world's urban population surpassed 50% in 2020, indicating a significant shift towards urban living. Sri Lanka's urban expansion and its people's social and cultural backgrounds are intrinsically linked. This study aims to understand the urban agglomeration and spatial development of the Colombo District in the last 50 years. Both primary and secondary data sources were utilized, including interviews with 30 experts and analysis of historical records, maps, and census data. A hybrid strategy involving GIS spatial analysis and qualitative analysis was employed to investigate urban agglomeration and spatial formation. The Space Syntax approach was used to examine street-to-street transitions and urban configurations, while the Landscape Expansion Matrix helped determine dynamic functions and systems. This research sheds light on Colombo's urban growth and its impact on socio-economic patterns.

Keywords: Urban agglomeration; Spatial transformation; Urbanization; Urban development; Colombo City

1. INTRODUCTION

Sri Lanka is urbanizing and transitioning to a service and manufacturing economy. Sri Lankan urbanization is slower than elsewhere in South Asia. One of the lowest population growth rates in emerging countries is 1.0 percent. From 2005 to 2015, its urban population grew 0.3 percent year, according to official statistics. Since it uses the official urban definition, Sri Lanka's urbanization rate is inaccurate. The country is urbanizing quicker than statistics indicate, but slower than other South Asian and Southeast Asian nations. The Western Region has the highest urbanization rate and highest economic density and productivity. Colombo District has the highest growth rate and urban agglomeration in the Western area. The ribbon and node patterns of this high urban agglomeration can be considered town agglomerations. Due to chaotic urban construction, urban expansion in Colombo is challenging. The government must comprehend how to extend the city and improve public services, infrastructure, etc. This study examines urban agglomerations and urban expansion in Colombo to close the gap. The results will help planners and decision makers think, analyze, and solve urban agglomeration issues. This research addresses two crucial questions. First, it examines Colombo's 50-year spatial development. Second, it identifies Colombo district urban agglomerations. This task had four objectives: (1) To explore spatial formation of the Colombo district during the past 50 years and (02) To analyze the present urban agglomerations in Colombo district Primary and secondary data were collected first. Data was analyzed using digital maps, historical papers, observations, expert opinions, and residence perspective. After processing, temporal mapping and quantitative analysis generate shapes. Space syntax and Land use structure change study determined urbanization type and growing agglomeration point.
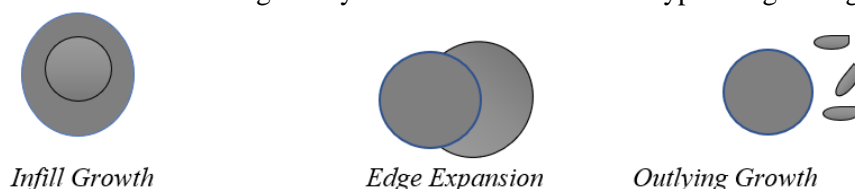

Infill Growth *Edge Expansion* *Outlying Growth*

Figure 1. Types of urban growth

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2. RESULTS AND DISCUSSION

2.1. Correlation between spatial configuration and population density Route No.01 - Galle Road

The Colombo-Gale Road is a good example of Colombo District spatial design and population density. Colombo Fort to Panadura Bridge, 25 kilometers in Southern Colombo District, is examined. In the Colombo core region, population density strongly correlates with spatial configuration. Due to the high number of commuters, Colombo's population density and spatial arrangement have been debated. Integration value significantly drops from Colombo Fort to Panadura, affecting population density. The integration value stays consistent for 11 kilometers, but beyond that, it follows the population pattern, suggesting the influence of active communities.
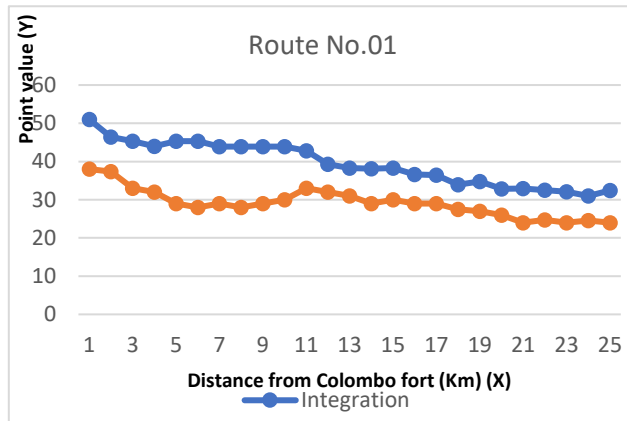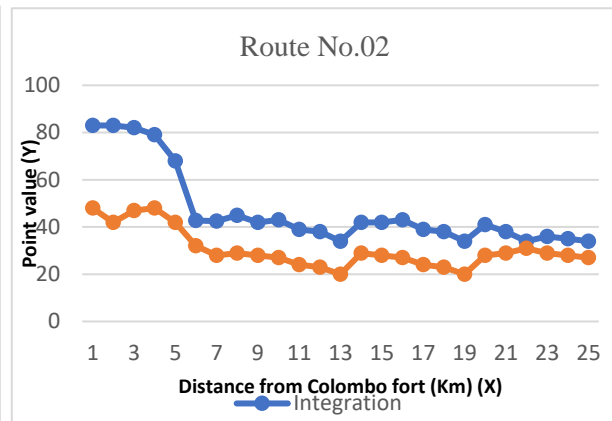

Figure 2. Route No.01 - Galle Road

Figure 3. Route No. 02-Kandy Road

2.2. Spatial Integration

Geographical analysis incorporates similarities, fluxes, and proximity. Several writers define spatial integration as how modern spatial planning tools and methods relate places. This economic, social, and physical interconnectedness promotes city development. Space Syntax quantifies integration by measuring the street-to-street transitions needed to reach all network street segments via the shortest paths. On the Colombo District Space Syntax index map, red and yellow indicate high integration and development potential. Analyzing proximity, density, and connectedness yields an urban agglomeration map for Colombo. Spatial integration and urban agglomeration patterns help target actions.
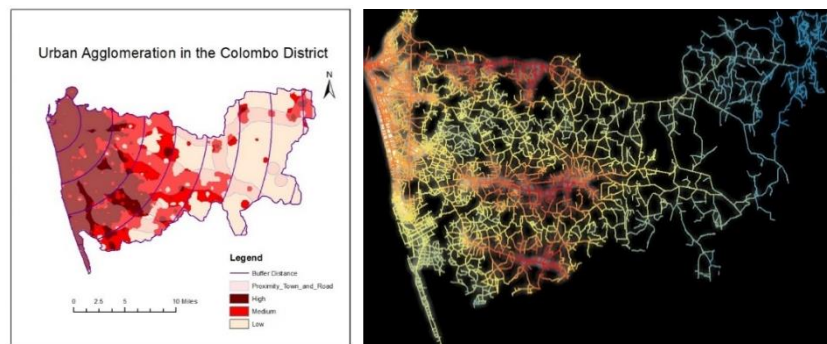

Figure 4. Spatial Integration

3. CONCLUSION

Sri Lanka's urban development strategies encourage migration to the Western region's other two districts and outlying territories. A sophisticated transport network, well-developed road infrastructure, low property values, and reduced pollution help developers lure residents from the centre area to the district's outskirts and outer regions. Major urban nodes at significant road junctions stimulate new development and population

growth in rural areas. Understanding the spatial shape, especially the rural-urban edge, is essential for growth planning. Some factors increase population growth, while others decrease it. As distance from the city grows, the population growth rate turns positive, suggesting a large commuting population. As urbanisation spreads outward, Colombo District sees a slowdown. The recently established Megapolis Plan aims to develop the other two Western Region districts and move some urban functions and population there. Density, closeness, and spatial integration indicate significant spatial integration and steady outward development.

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