

Web-Based Decision Support System to Evaluate Living Conditions: A Case Study of Colombo City

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Colombo city hosts almost eight hundred thousand people from various parts of the world and it is one of the fastest growing city in the Asian continent. The city subjects to heavy migration because of urbanization. Due to this reason, the living conditions vary from place to place in the city. The immigrants are often concerned about their mobility and accessibility to different civic services. Hence, selection of a living area becomes an important factor for an inhabitant physically, mentally and financially. However, systematic methodology has not been implemented to evaluate these living conditions. This study explicates utilizing of hotspot analysis and network Analysis extension of ArcGIS to extrapolate crime and the accessibility to six fundamental civic services including education, healthcare, public parks, shopping centres and emergency response (firefighting and ambulance) from different neighbourhoods of the city. Weighted overlay approach is utilized to aggregate above criteria and to find the most inhabitable neighbourhoods in the city. The study indicates the best area as “neighbourhoods with least crime and easiest accessibility to all mentioned fundamental services”. Accessibility to each civic service is calculated by service area and converted to a raster data which further aggregates them into a single raster using above mentioned weighted overlay approach. After exporting the graphical model as a python script, the system is further developed to handle and return dynamic influence rate based on the user inputs and ultimately the user obtains results for the best area. Then, the generated map automatically gets uploaded into the geoserver and the users can view final liveability map on a dedicated web platform. Based on the approaches such as network analysis, multi criteria evaluation and decision support system, this study assists in selecting a neighbourhood on the basis of the selected criteria by a particular user and also helps urban planners to identify design gaps in urban areas related to each criterion.

Keywords: accessibility analysis, decision support system, living conditions, urban planning, web GIS