INTEGRATION OF DAY-NIGHT IMAGING AND NON-IMAGING DATASETS FOR THE ASSESSMENT OF TEMPORAL CHANGES IN CITY STRUCTURE: A CASE STUDY OF RAIPUR CITY, INDIA

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THEME: Socioeconomic issues including health, urbanization and human heritage.

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INTRODUCTION:

The Raipur is the capital city of Chhattisgarh, India experiencing dramatic changes in its structure. The objectives are to measure the city structure integrating traditional and advances datasets and techniques for the assessment of the growth pattern of city. The structure of city consists of three layers as Inner city (within municipality), primary fringe (between inner city to secondary fringe) and secondary fringe (outside primary fringe). The delineation of rural-urban fringe for the year of 1971, 1981, 1991, 2001 and 2011 as **(1) Rural-urban fringe from day-time datasets: remote Sensing**- Landsat MSS (1972, GSD-79 m) Landsat TM (1981, GSD-28.50 m) (Landsat TM (1991, GSD-28.50 m); IRS-IC LISS-3 (2001, GSD 23.50m and PAN (2001, GSD 5.80m); Cartosat-1, PAN (2011, GSD 2.50m) Resourcesat-1 LISS-4 multispectral (2011, GSD 5.80m), and **demographic datasets** (Census of India, 1971, 1981, 2001, 2011). The following parameters has been used for the delineation of rural-urban fringe as (A) **Spatial** - Euclidian distance from city and Major roads and Percent of built-up area, (B) **Demographic** -Percent of non-agricultural workers, agricultural workers, literate persons and density of population. All these parameters were standardized and categorized into three functional zones using AHP Decision Support Systems and weight linear overlay operation in GIS. **(2) Rural-urban fringe from night-time datasets:** DMSP-OLS stable night light (1992, 2001, 2011, GSD 2.70 km, saturation level 0-63) were classified into three zones based on the intensity of Saturation in relation to the size and density of city population. Rural-urban fringe for the year of 1981, 1971 were interpolated using linear regression and MOLA techniques. Finally, Boyce-Clark Shape Index (1964) and Shape Membership function (Francesca Medda et al.1998) has been used for measuring city structure. The result is quite similar between two datasets which reveals the structure of City is varied from cross-shaped to star or finger-shaped. The finger-shaped pattern suggests unplanned growth and circular to rectangular shape suggest planned growth in homogeneous platforms.

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