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Title : *An index for measuring urbanisation in Tambaram Taluk, south of Chennai city*

Background:

Urbanisation is characterised by the presence of artificial structures, impervious surfaces, high density of people, domesticated animals and plants with altered flow of energy and nutrients. It may manifest often in a gradient of changes from the city on one side to a rural environment at the other end. The index shall capture these changes such that it can be used later to study the process of urbanisation taking place and may help assess its influence on natural resources, including water.

This thesis focuses on reviewing indices available in literature and considers developing an index to measure the rate of urbanisation process.

Objectives:

The objectives of the study are to

i) develop a simple index to measure urbanization;
ii) Apply it to the Tambaram taluk of the South Chennai area.

Research Methodology:

The methodology proposed consists of a simple weighted average index of sub factors defined by chosen factors of urbanisation. The urbanisation measures chosen are from the environmental and social features of the Tambaram taluk in South Chennai that reflects different aspects of the natural environment in an urban / peri-urban area. These fall under three major groups, namely demographic variables, physical variables and landscape metrics. A total of eleven variables are chosen. They are Density of People, Density of dwellings, Non agricultural workers, People per unit urban land cover, Road network density, Fraction impervious surface, Distance to central business district, Land cover richness, Dominant land cover, Percent of urban land cover and Simpsonś diversity index.

The Tambaram taluk consist of 49 villages and the required data for each village was collected from secondary sources and field visits and observations. The study area map and the population data was collected from the Revenue records of the Government of Tamil Nadu. The village map, agricultural and house hold census data were collected from the Statistical Department. The land cover map of the area was obtained from the Agricultural Engineering Department. The demographic variables were calculated from the census records, the physical and landscape metrics from the field visits and the land use land cover map of the study area. A principal component analysis of the above data produced a solution that explained 79 % of the total variation. The five variables which obtained high loadings on the principal components extracted were considered for the index. They are Density of Dwellings, People per unit urban land cover, Land cover richness, Dominant Land cover and Simpsonś diversity index.

Research Findings:

The index values were calculated for the 49 villages and were grouped into three categories, low urbanisation, moderately urbanised and highly urbanised villages. Three villages emerged as highly urbanised (> 0.65), nine villages as moderately urbanised (0.30 – 0.60) and 37 villages with low urbanisation (< 0.30). A village map based on index values indicate that the urbanisation taking place in the Tambaram taluk, does not show a linear gradient from the southern end of the Chennai city. It presented a pattern of clustered development around two villages, the Alandur village near the City and Pallavaram in the middle of the taluk. The location of moderately urbanised villages near the GST (Grand Southern Trunk) Road, a National Highway, seems to be influencing the urbanisation process. Field visits and observations suggest that the water bodies in the moderate to highly urbanised villages had water bodies of neglect, disuse or misuse and have poor quality of water when compared to the tanks in the less urbanised villages. This aspect needs further study to assess the environmental influences of urbanisation in Tambaram taluk, south of Chennai city.