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Effect of unplanned urban growth on human health and sustainable development: A spatial analysis of the urban growth patterns in Nepal

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Many South Asian (SA) countries are rapidly urbanizing, but Nepal's current annual urbanization rate of 5.6% is the highest among the SA countries. Though some urban areas of SA are undergoing major transformations under the influence of globalization, regionalization, and formation of special economic zones and are evolving as world class cities, Nepal's urban areas are unplanned, and exposed to possible seismic casualties and health hazards. Despite these problems, a reduction in Nepal's urban poverty rate from 25 percent to 15 percent that occurred between 2000 and 2010 is frequently attributed to increased urbanization. As a result, many Village Development Committees (VDCs) are clamoring for a municipality status merely based on their high population density despite their rural characteristics. The definitional changes from rural-to-municipal status have led to the formation of several *ruralopolises* where rural areas with high population density compete for collective urban facilities. Urban sprawl through unsustainable implosion has blended rural economic and social systems with metropolitan spatial organizations without the requisite spatially well-organized infrastructure.

This paper first provides a spatial analysis of Nepal's urban growth patterns from historical perspectives. Second, it geovisualizes urban morphologies of the Kathmandu metropolitan area using ESRI made CityEngine to display how unplanned concrete jungle would not only exert stresses on urban lives through increased heat waves and greenhouse gases, but also from increased urban vulnerabilities. Third, the paper analyzes urban sprawls and their unintended but irreversible environmental consequences on human health and sustainability. Fourth, it develops land use/cover metrics using remote sensing techniques to determine the ratio of built-in structures and open spaces. The ultimate goal of this paper is to provide a framework for the development of twenty-first century cities in South Asia.

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