

A Method Intensive Top-down Approach for Generating Guidelines for an Energy-Efficient Neighbourhood: A Case of Amaravati, Andhra Pradesh, India

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Abstract : Neighbourhood energy efficiency is a newly emerged term to address the quality of urban strata of built environment in terms of various covariates of sustainability. The concept of sustainability paradigm in developed nations has encouraged the policymakers for developing urban scale cities to envision plans under the aegis of urban scale sustainability. The concept of neighbourhood energy efficiency is realized a lot lately just when the cities, towns and other areas comprising this massive global urban strata have started facing a strong blow from climate change, energy crisis, cost hike and an alarming shortfall in the justice which the urban areas required. So this step of urban sustainability can be easily referred more as a 'Retrofit Action' which is to cover up the already affected urban structure. So even if we start energy efficiency for existing cities and urban areas the initial layer remains, for which a complete model of urban sustainability still lacks definition. Urban sustainability is a broadly spoken off word with end number of parameters and policies through which the loop can be met. Out of which neighbourhood energy efficiency can be an integral part where the concept and index of neighbourhood scale indicators, block level indicators and building physics parameters can be understood, analyzed and concluded to help emerge guidelines for urban scale sustainability. The future of neighbourhood energy efficiency not only lies in energy efficiency but also important parameters like quality of life, access to green, access to daylight, outdoor comfort, natural ventilation etc. So apart from designing less energy-hungry buildings, it is required to create a built environment which will create less stress on buildings to consume more energy. A lot of literary analysis has been done in the Western countries prominently in Spain, Paris and also Hong Kong, leaving a distinct gap in the Indian scenario in exploring the sustainability at the urban strata. The site for the study has been selected in the upcoming capital city of Amaravati which can be replicated with similar neighbourhood typologies in the area. The paper suggests a methodical intent to quantify energy and sustainability indices in detail taking by involving several macro, meso and micro level covariates and parameters. Several iterations have been made both at macro and micro level and have been subjected to simulation, computation and mathematical models and finally to comparative analysis. Parameters at all levels are analyzed to suggest the best case scenarios which in turn is extrapolated to the macro level finally coming out with a proposal model for energy efficient neighbourhood and worked out guidelines with significance and correlations derived.

Keywords : energy quantification, macro scale parameters, meso scale parameters, micro scale parameters

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