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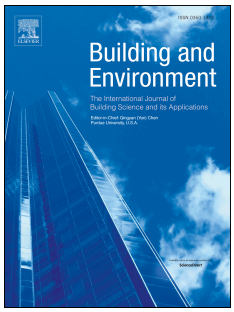

A bioclimatic approach to develop spatial zoning maps for comfort, passive heating and cooling strategies within a composite zone of India

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Abstract: Bioclimatic potential studies are important for passive design applications in the conceptual stage of climate responsive building design. Being a land of vast climatic diversity, very few such studies exist in India. This paper aims to develop bio climatic charts for 21 locations within a composite climate zone in India. Spatial zoning maps for natural comfort and passive heating and cooling strategies have been developed for these 21 selected locations based on adaptive comfort criteria. A further evaluation of the bioclimatic potential analysis was carried out through a simple heating and cooling energy load simulation for all locations. Impact of the local climate on building heating and cooling energy load was evaluated using statistical techniques thus establishing a direct relationship between bioclimatic potential and annual energy load. Results show great variation in comfort and passive design potential even within the composite zone. A gradual increase in the number of comfort hours was observed as one moves geographically from the north towards south within the composite zone. The natural comfort potential varies from 23 to 46%, passive cooling potential varies between 26.5 to 53.5% and the passive solar heating potential varies from 3 to 20 % of the time of the year based on location.