A thematic review of recent urban overheating impacts research in Asia and its applications to climate resilience

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Urban areas will be subjected to temperature increases from a combination of global-scale climate change and local-scale urban heat island drivers. The resultant combined heat risk – urban overheating – will notably challenge cities in securing the resilience of public health to combined urban overheating. Although global climate change research is ubiquitous, the urban climate and biometeorological research literature of this century reveals a lag of (sub-) tropical Asian regional studies behind Europe and North America. Through a systematic research review of international urban-scale climate and biometeorological literature from 2000-2019, we propose to reflect the state of the art of the urban overheating issue in Asia alongside its penetration in the regional climate resilience discourses.

The review reveals (i.) a rise of the number of urban overheating studies throughout in the region in conjunction with rapid demographic and developmental change, except for the central Asia region; (ii.) a “metropolitisation” of the urban heat and biometeorological knowledge, meaning a spatial organization of the knowledge reinforcing the leading position of the Asian national and regional primate cities; (iii.) distinct themes of more research into: large focus on remote-sensed urban heat mapping of Chinese and Indian urban clusters, evaluation of heat mitigation strategies from modeling experiments in nations having economies in transition, compared to more focus on urban-wide heat mortality epidemiological studies in countries already facing aging issues.

Considering the lack of global climate change considerations in urban overheating and biometeorological studies, the review appeals for a more systematic vision of the urban heat issues where urban overheating consequences (i.e. thermal discomfort, heat morbidity, and mortality) are analyzed and discussed conjunctly with the geographical background of the cities, its urban fabric properties, and its socio-demographic dynamics.