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Adaptation of the Barcelona Metropolitan Area to Climate Change, especially to hot temperature extremes

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The world is becoming urbanized, and this urbanization is predominantly metropolitan. In 2020, one-third of humanity lived in metropolises (60% of the global urban population), a percentage expected to reach 39% by 2035. Metropolises have become spaces of well-being and opportunities, drivers of innovation and productivity, and key actors in addressing current global challenges that surpass the administrative limits of cities.

The Barcelona Metropolitan Area (AMB), with 3.3 million inhabitants and densities that can exceed 20,000 inhabitants/km2 is an example of it. In the AMB, climate governance operates on different scales, referring to multilevel governance. The management of metabolic flows in this demanding territory continues to be transformative of the environment and causes impacts in the Anthropocene era.

For example, various studies show how energy poverty in summer has increased (by 30% in 2023). This is worrying in a territory where heat vulnerability affects 560,000 of its inhabitants and is concentrated in 9 of its 36 municipalities. Technological solutions involve electrifying and reducing demand for conditioned air, a controversial measure attending to GHE.

The survey 'Perceptions and Strategies for Adapting to Extreme Heat in Vulnerable Metropolitan Households,' conducted by the Barcelona Metropolitan Area (AMB) and the Metròpoli Institute in the summer of 2023 on heat perception, demonstrated more than 60% of surveyed individuals living in these more vulnerable areas (depending on Vulnerability Index to Climate Change 2022) report having air conditioning units, yet 30.7% of them state that they cannot maintain their homes at an adequate temperature during the summer, and 19.3% during the colder months. Energy poverty is particularly worsening in these vulnerable areas with the increase in summer temperatures.

Projections of temperature evolution (heat) at the neighborhood level and how they can be modulated with certain measures (greenery, rehabilitation, shade strategies, etc.) are also essential, and the AMB is studying them with the support of various university research groups, to design effective policies that integrate climate change adaptation into urban design and maintenance, it is crucial to adopt a comprehensive and evidence-based approach.