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Temporal Trends in the Urban Metabolism of Riyadh, Saudi Arabia

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Abstract : Cities with rapid growth face tremendous challenges not only to provide services to meet this growth but also to assure that this growth occurs in a sustainable way. The consumption of material, energy, and water resources is inextricably linked to population growth with a unique impact in urban areas, especially in light of significant investments in infrastructure to support urban development. Urban Metabolism (UM) is becoming popular as it provides a framework accounting the mass and energy flows through a city. The objective of this study is to determine the energy and material flows of Riyadh, Saudi Arabia using locally generated data from 1996 and 2012 and analyzing the temporal trends of energy and material flows. Preliminary results show that while the population of Riyadh grew 90% since 1996, the input and output flows have increased at higher rate. Results also show increasing in energy mobile consumption from 61k TJ in 1996 to 157k TJ in 2012 which points to Riyadh's inefficient urban form. The study findings highlight the importance to develop effective policies for improving the use of resources.

Keywords : energy and water consumption, sustainability, urban development, urban metabolism
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