

Chapter 7

Urban Transition and Its Impact on Mesoscale Weather: A Review

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ABSTRACT

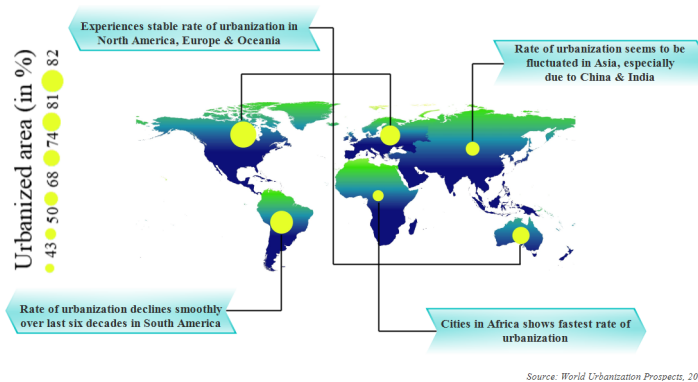
Urban transition is an unstoppable process. Globally, several planning measures are taken by the city and country administration to control the sprawling process. Despite all the planning, most of the cities experience appreciable impact of urbanization on the localized weather parameters. This chapter summarizes the understanding relating to urban modification of localized weather, that is, changes in precipitation, temperature, and wind speed in the form of increase or decrease, their spatio-temporal distribution, urban heat island (UHI), and urban wind island (UWI). The impacts of the urbanization are primarily because of changes in land-surface characteristics due to the alteration of land use in a city. The urbanization effects on local or mesoscale weather could be studied both through observations and/or numerical modeling. The purpose of this chapter is to provide a review of most of the relevant studies carried out globally and with a special emphasis on India.

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INTRODUCTION

Urban transition is broadly the shift from rural to urban land use (LU) and economically from agricultural to industrial, commercial, or service employment (Pannell, 1995). According to the United Nations (UN), globally, 55% percent of the population currently resides in cities, and this figure projected to be two-thirds of the world population by 2050 as the growing population concentrates in cities and towns in search of better livelihoods and opportunities (DESA, 2018). This process of urbanization gives rise to the expansion of existing cities to form mega cities and evolution of new cities, which accelerates the changes in existing land use and land cover (LULC). Studies suggest that the major causes of land cover (LC) changes are neither population nor poverty alone; rather, it is people's response to economic opportunities. Mostly, global factors are the main determinants of LU change as they are weakened by the local factors (Lambin et al., 2001). Besides these causes of urban transition, the development of an area as urban land takes place only when the post-development value of the land and the percentage growth rate of rent increases. Urban transition in the outskirts of core cities is directly affected by the emerging economy and due to foreign investments.

Figure 1. Global trends and rate of change of urbanization.



The global trends and rate of urbanization over different parts of the world illustrated in figure 1. The rate of urbanization found to be either stagnant or declining in other parts of the world except for Asia and Africa, where the rural to urban transition mostly occurs. However, the urbanization in African countries is driven by global historical process like population dynamics and rural-urban migration, both of which are stimulated by technological and institutional changes.

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