

P. Fan, J. Chen, Z. Yang, P. Groisman, T. Loboda, G. Gutman, A. Prishchepov, A. Kavshinina, and j. Qi

**Urbanization and sustainable societal development under transitional economies and global change:
A synthesis of North Asia Cities**

North Asia, extending a vast territory of 13 million km² that includes Ural, Siberia, and the Far East Federal District, of Russia, hosted less than 38 million population in 2016. The cities in North Asia have been experiencing new challenges since the collapse of the USSR in 1991, such as de-industrialization, land abandonment, depopulation of remote areas, internal (e.g., from the countryside into the cities) and external (brain drain) migration, weakening of social fabrics, market reforms in health service, moral demise reflected by higher crime rates, corruption, and overexploitation of millions “illegal immigrants” from other republics of the USSR, and interethnic conflicts in North Caucasus. “Democracy” restoration in Afghanistan caused a continuous civil war and a two-order increase of hard narcotics traffic from this country to the northern Asia cities. All the above provides us not only hard-learned tragic lessons but also an experiment opportunity to study the unique dynamics of the urban systems in northern Asia. Our objective is to synthesize the data and knowledge for the urban sustainability of these cities in the context of socioeconomic transformation and (possibly) climatic change. We will link key socioeconomic and biophysical drivers, especially institutional mechanism unique in transitional economies and global climate changes, to the spatiotemporal changes of urbanization and urban sustainability in North Asia. Major lessons include:

- (1) Urban development in the forms of population and urban land changes has followed a distinct pattern in North Asia since the collapse of the former Soviet Union, large variations exist in time and space, which are particularly associated with population size, geographic location, and the level of economic development.
- (2) Urban sustainability and its three dimensions, i.e., economic development, environmental protection, and social equity, followed very different patterns in time and space.
- (3) Transitional economy reflected by policy shifts and increasing links with global communities have exerted different degrees of influence on urban development and sustainability in different parts of North Asia.
- (4) Global climate change has affected urbanization in different climate zones and biomes in different ways, with urbanization in some biomes experiencing a much faster pace than that in others.
- (5) The evolutions of urban ecosystems in these cities, reflected by various ecosystem services (e.g., air and water pollution, green spaces) have direct connections with urbanization processes and socioeconomic development.