

## Guest editors' introduction

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Published online: 29 November 2011  
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China's economic, demographic, and environmental impact on the world continues to expand. In seeking solutions to the pressing challenges of global change, it is vital that we better understand the processes that guide China's development. Among these, urbanization plays a critical role.

This journal special issue had its origin in the International Institute for Applied Systems Analysis (IIASA)—Peking University Symposium on Urbanization and Environment in China held at Peking University on 22–23 November, 2008. At that symposium, over a dozen Chinese and Western researchers presented papers whose unifying theme was applied modeling of the processes that govern the complex relationships between urbanization, demographic change, economic growth, and natural resources and the environment in China. The papers presented at the symposium were outputs of the collaborative project of the Natural Science Foundation of China (NSFC) and IIASA on “National and Regional Urbanization Projections” (2004–2006).

The papers presented here address the broad questions: What are the distributional aspects of the Chinese urbanization process? What does the future hold? How will rapidly growing urban populations' demand for water, food, energy, and other natural resources be met? Can China's urbanization be environmentally sustainable? What kinds of policies are needed to ensure the environmental and social sustainability of urbanization in China?

This special issue divides roughly into three parts. The first three papers deal with the process of urbanization. Cao et al. apply multistate modeling techniques to project urban population growth, finding that the labor force will constitute a larger

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share of total population in urban areas than rural due to internal migration. The level of education of rural labor will remain low, which could present a challenge to China's achieving its goal of making the transition to a service—and knowledge-based economy. Willmore et al. explore the determinants of rural to urban migration, finding that, beyond a relatively low threshold, education actually decreases the probability of migration. Wang et al. present an innovative cluster analysis incorporating an evolutionary perspective on the development of Chinese cities.

The next group of papers deals with the implications of Chinese urban growth for natural resources and the environment. Zhou et al. examine energy consumption associated with various urban sectors such as residential energy consumption, transportation, and building materials, finding that the share of urban energy consumption in total energy consumption has, surprisingly, remained stable. Zhang examines associations between land and water use and concludes that during the last 5 years, the previous trend of decreasing water consumption in Beijing has been reversed. Wang et al. approach issues of population re-settlement following natural catastrophes using a carrying-capacity approach.

The final two papers deal with health-related aspects of urbanization. Fischer et al. project agricultural production trends and draw attention to the risks associated with the intensification of livestock production and excessive fertilization of crops in close proximity to cities. Zheng et al. look at heavy metal pollution, an indirect impact of urbanization, and its association with birth defects.

Taken together, these papers represent a significant contribution to the literature concerning a major global change issue, namely urbanization and the environment in China. It is hoped that, by bringing together Chinese and Western experts in the field, the IIASA—Peking University symposium contributed to improved scientific understanding and, as emphasized in these papers, deeper understanding of associated policy issues and options.

We are grateful to Professor Zhenghua Jiang, Former Vice Chairman of the 10th National People's Congress Standing Committee and Former Vice Minister of the State Family Planning Commission, for providing a Foreword to this special issue, and to Professor Lori Hunter, Editor in Chief of the journal, for her support. Professor Xiaoying Zheng of the Institute of Population Research co-organized the symposium and participated in the preparation of this special issue, for which we thank her. We also acknowledge the reviewers who gave generously of their time and Betty Preihs of IIASA for administrative support.