

Environmental Impacts of China's Urbanization from 2000 to 2010 and Management Implications

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Abstract Rapid urbanization in China during the first decade of the twenty first century has brought about profound environmental changes at citywide and regional scales. In this paper, we present a comprehensive set of indicators and put forward a new evaluation method for measuring environmental impacts of urbanization from 2000 to 2010. We compared these impacts among 286 cities in mainland China and found that the overall quantity of pollutant discharge decreased as cities became more economically developed during the years 2000–2010. However, larger and denser cities, and wealthier cities in the eastern part of China tended to have larger quantities of pollutant discharge, resource consumption, and changes in

land use (i.e., expansion of the built environment). The discharge increase occurred despite these cities having increased their investment in pollution control and construction of municipal environmental infrastructure. The negative impact from the intensity of pollutant discharge (i.e., discharge per unit of economic output) was generally less in more developed cities, although this was not always the case. Some cities, such as resource-based cities and old industrial cities, had both larger quantities of pollutant discharge and greater pollution intensity compared to other types of cities, indicating that environmental impacts did not necessarily decrease with increasing urbanization. The results of this study provide a promising basis for decision-making to reduce the impacts for different types of cities in the decades to come.

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Introduction

With rapid economic development and expansion of the built environment, urbanization has taken place at an unprecedented rate in China since the year 2000. The proportion of the Chinese population living in urban areas reached 50 % in 2010, whereas it was 36 % only a decade previously. This trend is expected to continue, with a projected increase of 270 million in China's urban population over the next two decades (United Nations 2010). The urban built-up land area in China has grown by 78.5 % over the past decade—even faster than its urban population, which grew by 46 % (Bai et al. 2014). This rapid urbanization has resulted in many aspects of environmental change, and pollutant discharges, resource consumption,