

Chinese Urbanization: Efforts to Manage the Rapid Growth of Cities

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Abstract

China has experienced rapid levels of urbanization in recent years. Urbanization has lifted many out of poverty and helped to raise GDP per capita, ultimately bettering the living standards for millions of people in China. Although there are many positive results from recent urbanization, China faces a problem of unsustainability. Urbanization has led to pollution, income inequality, water scarcity and high levels of energy use. It is questioned whether China can properly deal with these negative side effects while sustaining economic growth and overall prosperity. This article reviews the empirical background of China and discusses positive outcomes as well as negative implications of urbanization. Furthermore, it examines some strides China has already made in managing urban growth. The article comes to the conclusion that China has successfully set up programs and institutions that may potentially lead to economic sustainability, but suggests that these programs must be strengthened to increase their potential.

I. Introduction

China's urbanization started some 4,000 years ago and has come a long way. During the last three decades, China has achieved rapid economic growth and massive industrialization, supported by urbanization. Although China has accomplished amazing economic success, it also faces many challenges. It has to take necessary strides to control pollution, water scarcity, and negative side effects of urban expansion. It needs to develop plans to ensure economic sustainability. Although many applaud China on their great success in urbanization, this country now has to create the proper institutions to ensure sustainability of its success.

Following this introduction, this article first summarizes some major publications concerning China's urbanization. It then reviews the empirical background of China such as its population growth, economic growth, life expectancy, and some statistics regarding the implications of industrialization in China. It then analyzes some of the main negative implications of China's industrialization, which include a sharp increase in energy use, pollution and income inequality. Before providing some conclusions, this article outlines some of China's efforts to manage rapid industrialization.

II. Literature Review

There are many publications that provide information on the positive and negative aspects of China's urbanization. It is often debated whether urbanization directly leads to economic growth or if this is a common misconception. The following three recent publications discuss a variety of these issues.

First, Xuemei Bai, Jing Cheng and Peijun Shi (2012) uncover a theory that urbanization in China spills over to other non-developed regions and contributes to overall economic prosperity. They argue that the accelerated urbanization in China has led to increased economic development and decreased income disparity. In these authors' analysis of this relationship, they found that larger and richer cities gain more income than poorer or smaller cities and that there is a long-term connection between urban built-up expansion and GDP per capita at the city and provincial level, and a short-term causality at the provincial level. This overall suggests "a positive feedback between landscape urbanization and urban and regional economic growth in China."¹ In layman's terms, urbanization in China is found by these authors to lead to direct economic growth in the cities, as well as spillover in the non-city regions. In response to this increased urbanization in China, Bai, Cheng and Shi (2012, p. 37) predict "it might be difficult for China to control urban expansion without sacrificing economic growth." This is a commonly proposed downfall of China's urbanization. They also question how China will sustain their growth once urbanization will reach its limit.

The second article by Jie Chen (2007), entitled "Rapid Urbanization in China: A Real Challenge to Soil Protection and Food Security", is about the threat of urban expansion into rural land. This is a very pressed issue and one that is constantly brought up when one considers China's ability to sustain growth. Chen cautions that maintaining rapid urbanization is maintaining some other downfalls that come with it. There is widespread concern over the increased expansion of urban development into agricultural land. Chen (2007) expresses that accelerated urban use of productive soil landscapes may threaten food security and environment sustainability. Chen also notes that some optimistically believe that with good planning and management, a significant increase in urban population can be accommodated by limited increase of land area. The question is if China will develop enough planning and management to ensure that its growth will be sustainable. Another large concern related to rapid urban development is pollution.

The article by Bingheng Chen et al. (2011) illustrates some major pollution issues that China faces. They write that pollution is one of the greatest downfalls that China is currently experiencing and that maintaining urbanization is maintaining the pollution that often comes with cities. They also reveal the fact that air pollutants in China are at high levels when compared to the rest of the world. However, China is taking strides to control this particular causation of their urbanization. China has a Ministry of Environmental Protection who released an index for controlling/reducing sulfur dioxide (SO₂) emissions, which is a concern in China. In 2007, these emissions declined for the first time, revealing the control China has over the situation.

III. Empirical Background

Urbanization is generally defined as an increase in the urban share of total population in a country. Therefore, it is important to look at how China's urban population has developed over the years,

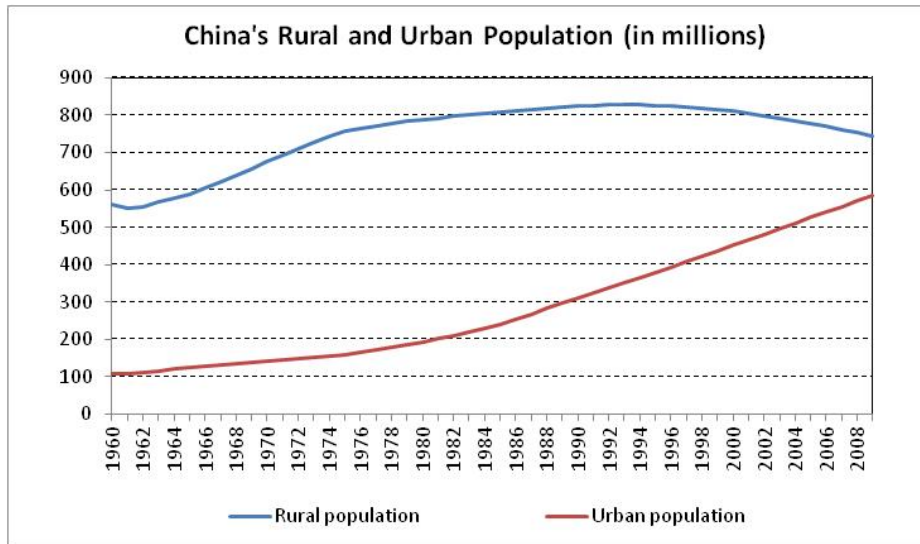
¹ Bai, Cheng and Shi (2012), p. 137.

as well as how their whole population has grown. China’s economy has grown alongside its urban population, suggesting a positive relation between urban growth and prosperity in China. It is interesting to look at increases in GDP as well GDP per capita. Also, it is interesting to see if growth in income positively affects Chinese life. High levels of industrialization tend to come with urbanization. As more people move to the urban areas, more needs to be built to accommodate people and business. More industry can lead to negatives such as higher carbon dioxide (CO₂) emissions.

III.1. China’s Urban Population Growth

China’s total population is currently about 1.34 billion. As seen in Figure 1, while the rural population has reached its maximum in 1993, the urban population continues to grow sharply. Indeed, within the last twenty years (1989-2009), China’s urban population almost doubled. Of the 670 cities China had in 2007, 89 had a population of over one million people. In comparison, the United States has about 37 cities of similar size, and India has about 32 cities of similar size (World Bank, 2008). The World Bank (2008) also projects that by 2025 about 64 percent of China’s population will live in cities.

Figure 1: China’s Rural and Urban Population, 1960 -2009



Source: Created by author based on World Bank (2011).

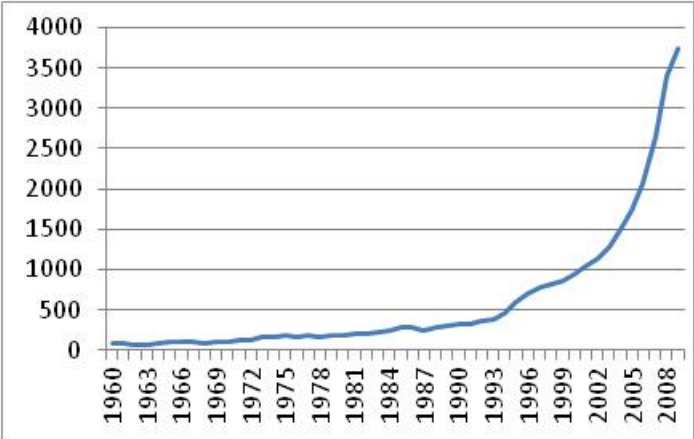
III.2. Economic Growth

In their extended research of urbanization in China, researchers Xuemei Bai, Jing Chen and Peijun Shi (2012, p. 132) conclude that “if measured by a landscape indicator, [urbanization] does has a causal effect on economic growth in China, and that urban land expansion is not only the consequence of economic growth in cities, but also drivers of such growth.” This is to say that urbanization and economic growth evolve in a circle that economic growth leads to urban land expansion and in return urban land expansion leads to more economic growth.

Expressed in current U.S. dollars, China’s GDP amounted to US\$5.0 trillion in 2009. Ten years

earlier, it amounted to only US\$1.1 trillion (World Bank, 2011). In real terms, China’s average annual GDP growth rate during 1999-2009 was 10.0 percent. Taking population growth into account, GDP per capita stood at US\$865 in 1999, which increased to US\$3,744 in 2009, see Figure 2. These increases in per capita income are said to have lifted more than 400 million people out of poverty.

Figure 2: GDP per capita (current US\$)

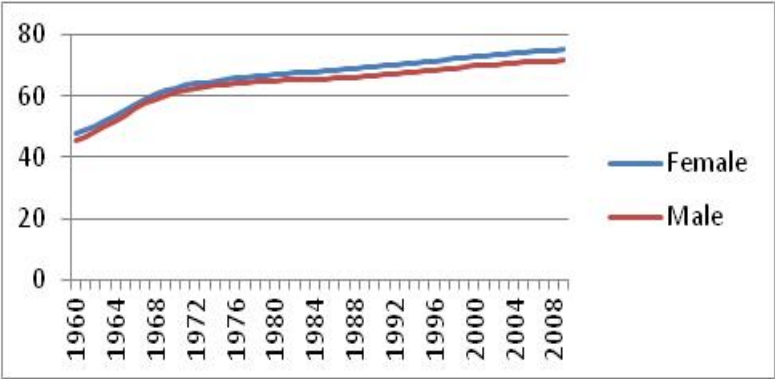


Source: Created by author based on World Bank (2011).

III.3. Progress in Life Expectancy

This increase in income per capita should also positively reflect on the quality of life in China. For example, life expectancy (see Figure 3) has also increased significantly. Specifically looking at the experience during the last ten years of available data, average life expectancy at birth increased from 71.0 years in 1999 to 73.3 years in 2009 (World Bank, 2011).

Figure 3: Life Expectancy at Birth



Source: Created by author based on World Bank (2011).

IV. Negative Implications of China's Urbanization

Increased urbanization and GDP growth are not all positive. They come with many negative side effects. Rapid increases in pollution, energy use, emissions of carbon dioxide and water scarcity are four major issues that China is facing today as a result of urbanization and GDP growth. Furthermore, there also are some indications of increases in income inequality, which may threaten China's social fabric.

IV.1. Pollution in China²

A sharp increase in the level of dangerous pollutants in the air is extremely detrimental to health in China as well as the health of the world's environment. Cases of lung disease and respiratory system problems have increased during the last few decades. According to the World Bank (2007, p. xiii), "the economic burden of premature mortality and morbidity associated with air pollution was 157.3 billion yuan in 2003, or 1.16 percent of GDP."

China's emissions of sulfur dioxide (SO₂) are the largest in the world. SO₂ emissions due to increased fossil fuel use, mainly leads to acid rain. Acid rain damages crops and materials, resulting in a cost of 30 billion yuan in lost crops and 7 billion in damaged materials. This reveals that pollution, caused by urbanization, is reflecting on the lives of the rural population, which is typically much poorer than the urban population. The damaged crops amount to 1.8 percent of the total value of agricultural output.

Another major concern of pollution in China involves water pollution. By 2005, about half of the seven main rivers in China were polluted and regarded unsafe to consume. In rural China, some 115 million people rely on these waters as drinking water. It is also estimated that around 11 percent of cancer cases in digestive system can be attributed to polluted drinking water. The cost of water pollution due to water scarcity is about 147 billion yuan or about 1 percent of GDP. The cost of irrigation with polluted water is about 7 billion yuan per year (or 0.05 percent of GDP), and the cost of water pollution in commercial fisheries is approximately 4 billion yuan per year (about 0.03 percent of GDP).

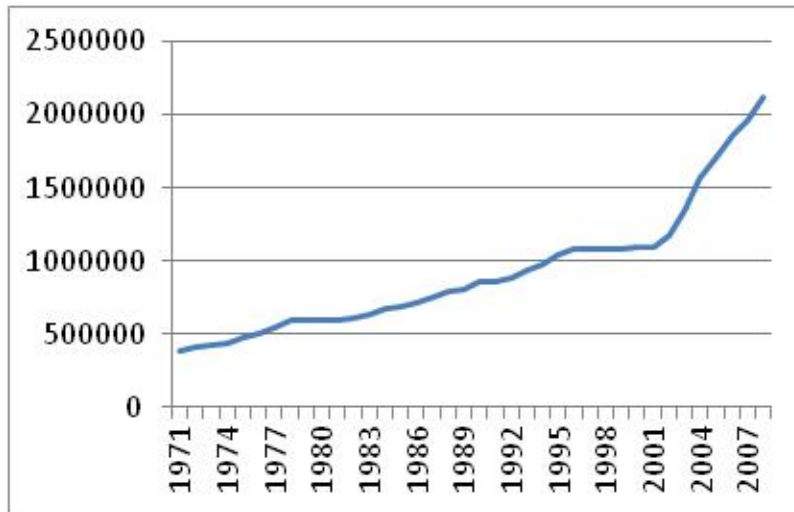
The health and non-health cost of outdoor air and water pollution for China's economy comes to around US\$100 billion a year. It is arguable that urbanization has brought much more economic prosperity than the pollutants from it are costing. However, it is difficult to put a cost on someone's health as well as the health of our world.

IV.2. Energy Use

Especially in the last decade, Chinese energy use has increased majorly, see Figure 4. Urban residents use 3.6 times as much energy as rural residents do, and the energy intensity in China, which is expressed by the consumption of energy per unit of GDP, is 7 times the amount it is in Japan and 3.5 times the amount it is in the United States (World Bank, 2008). These basic statistics show how extreme energy use is in China compared to some industrialized countries. These numbers are extraordinary and suggest that China needs to start conserving resources in a better manner.

² This sub-section is based on World Bank (2007).

Figure 4: Energy Use (kilo tons of oil equivalents)

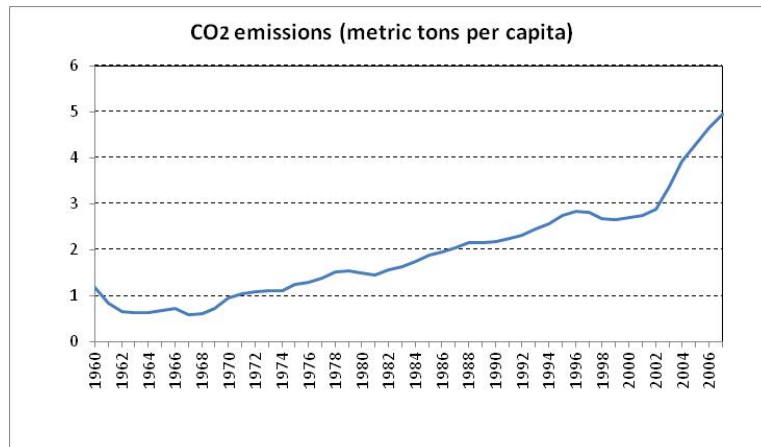


Source: Created by author based on World Bank (2011).

IV.3. Increases in CO₂ Emissions

Another main problem of China's urbanization process has been the emissions of carbon dioxide (CO₂). As shown in Figure 5, some 30-40 years ago, China's CO₂ emissions were around one metric ton per capita; in 2008 it was measured to be around 5. This is a huge increase and China is faced with the challenge to control the emission of CO₂ that come with industrialization.

Figure 5: CO₂ Emissions (Metric Tons per capita), 1960-2007



Source: Created by author based on World Bank (2011).

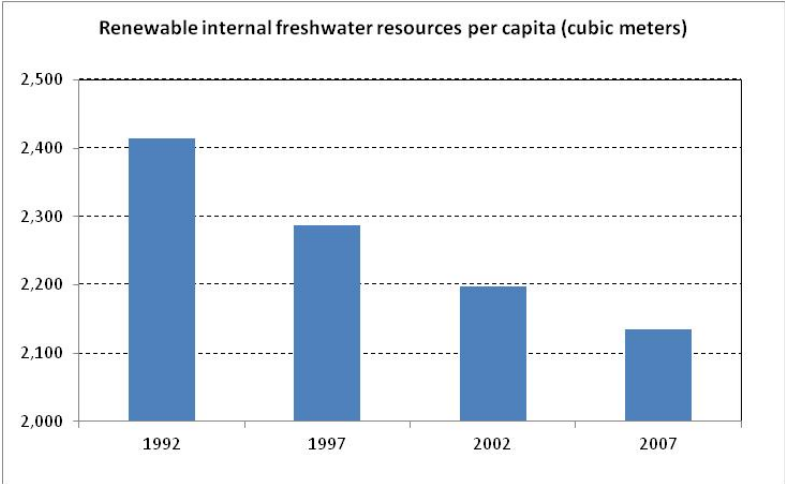
IV.4. Growing Scarcity of Water

About 1.1 billion people lack access to clean water today (United Nations Development Programme, 2006). Water is a shared resource across all nations and it is everyone's responsibility to learn how to treat water as a valuable resource and reallocate it more efficiently. Urban

development in China has resulted largely in huge amounts of water consumption. China uses six times more water per unit of GDP than Korea and ten times that of Japan (Shalizi, 2008, p. 166). However, as Figure 6 shows, water availability per person has been decreasing in China. Today, China’s per capita availability of water is about one third of the world’s average at 6,794 cubic meters per person, or one quarter of the U.S. average of 9,446 cubic meters per person (World Bank, 2007).

The combination of using a lot of water while having relatively few water sources implies that China is facing a severe water crisis. In 2000, the total water shortage was 38.8 billion cubic meters. Since then, the situation has only gotten worse. It is projected that the shortage will reach 56.5 billion cubic meters by 2050. Therefore, water scarcity in China ends up hurting their economy in the long run. This is why China needs to be more careful with their water use.

Figure 6: Freshwater Resources per capita (available years)



Source: Created by author based on World Bank (2011).

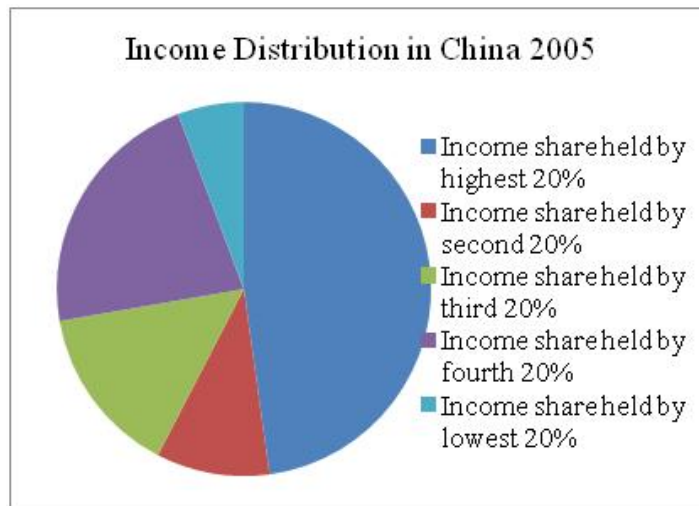
Possible solutions to this problem is using market price signals to allocate water to its most needed use. This would result in raising costs of water. China has attempted to fix the water problem by investing in physical infrastructure such as wastewater plants. More than 1000 wastewater plants were built between 2000 and 2006. However the utilization rate was only 60 percent and about 50 plants located in 30 cities operated below a 30 percent capacity (Okadera, Watanabe and Xu, 2006). This is perhaps due to the fact that revenues are transferred to the city budget that does not ensure the plants have all the resources needed to operate.

IV.5. Income Inequality

Income inequality is of some concern in China. Although all areas of China have seen rises in income, the skilled working populations as well as those living in coastal areas have benefited more from recent urbanization and economic growth than those living in rural areas. While Xubei Luo and Nong Zhu (2008, p. 2) state that inequality “can be desirable to some extent as it unleashes competitive pressure and creates incentives for investment in skills” they recognize that providing education to poor people is important and necessary for sustainable growth and equitable

distribution in the long run. China is worried about rising income inequality as it does not want to fall into a trap where the rich are getting richer and the poor are getting poorer. This is not necessarily happening in China at this point, but scholars such as Luo and Zhu (2008) offer concern that it might. They argue (p. 20) that as the “economic reforms deepen, labor markets work more efficiently by balancing the demand and supply of skills.” In other words, they are saying that as the economy continues to change through urbanization and reform, skilled workers will benefit much more than non-skilled workers and hence, accelerate income inequality.

Figure 7: Income Distribution in China (2005)



Source: Created by author based on World Bank (2011).

As shown in Figure 7, the richest twenty percent of people own about half the income in China. A well thought out reason for this inequality is the lack of education in poor areas. Under China’s unique decentralized fiscal system, providing and funding for education is a responsibility of local governments. Poorer areas will not be able to afford the costs of basic education leaving these people behind. Luo and Zhu (2008, p. 21) express that a “narrowing of gaps in education” could lead to “harmonizing income distribution in the long run”. In poor areas, many Chinese are not receiving a quality education, and the ones who do, are not that well off either. Among those with nine or more years of education in poor areas of China, the poverty rate is 10 percent, compared to a national average of 2 percent (Luo and Zhu, 2008, p. 20).

As urbanization continues in China, urban residents will continue to take up opportunities that are there for them and become wealthier, while poorer rural residents and farmers will continue to suffer. Furthermore, pollution in urban cities affects the farmer’s crops in ways such as acid rain. It is up to the Chinese government to properly manage rapid urbanization without allowing it to hurt the parts of their country that are not urbanizing.

V. How does China Aim to Manage Its Urbanization?

China needs to find a way to manage its rapid growth and continue to keep it sustainable. In order to control and manage its economy, China must work to manage its urbanization. Leaders must

learn how to address the challenges of large urban life such as land management, finance, environmental risks, disaster planning, and many more.

V.1. Environmental Health Action Plan

Presently, an environmental health action plan is being drafted by China's State Environmental Protection Administration (SEPA) and the Ministry of Health. This plan intends to tackle the mortality and morbidity impacts of water and air pollution in China. It will focus mostly on northern China where air and water pollution is the worst (World Bank, 2007). It also plans to focus in areas where the poor are affected by a lack of clean water.

Although this plan has only arisen because of the terrible environmental impacts of urbanization, it is still worth noting it as a positive result. There is a general consensus that our world today needs to pay much higher attention to the way the environment is treated. Plans to aid the environment are positive and good examples are important. Any efforts made to help the environment, no matter what caused environmental damage, are necessary and positive.

V.2. The World Bank Institute's Urban Program³

China has partnered with the World Bank Institute, who has made efforts to help China manage their urbanization, through the so-called Urban Program. This program mainly aims to inform policymakers, municipal staff and practitioners with cutting-edge knowledge and skills that will help them manage urbanization in an effective manner. It includes many learning programs that leaders in China are expected to take part in.

One program element, called "Sustainable Urban Development and Management", is directed towards high-level city officials to help them with city management. It gives city officials skills and information on spatial planning, land management, urban infrastructure finance, urban-rural linkages, metropolitan management, environmental management, disaster-risk management, and climate resilience. This specific program has served over 4,000 civil servants in the past eleven years. Since urban life has changed so much, especially in the past decade, a program like this is extremely useful in helping officials learn how to deal with all the challenges.

Another program element is that with support of the World Bank Institute, the Chinese Academy of Governance offers two courses to help city management learn more about successfully managing urban life. One is called "Urban Planning: Coping with Emerging Challenges" and the other one is called "Sustainable Urban Land Use Planning". These courses are delivered at provincial and municipal level administration schools and have been successful in offering support to city managers. The World Bank Institute collaborates also with Urban Planning Society on China on Annual Planning Conference, which is one of China's biggest events held to share information on urbanization including discussions on climate change and economic geography. This conference includes a network of about 20,000 urban practitioners.

These courses and conference offer the support that China needs in urban management. Chinese officials are able to learn how to manage urbanization successfully through the huge branch of knowledge that is being supplied. These efforts to channel knowledge into successful managing practices seem to be working. Yusuf, the Senior Adviser in the World Bank's Development Research Group, says "one of China's greatest successes in its rapid urbanization has been that it

³ Unless otherwise noted, this sub-section is based on World Bank Institute (2011).

has managed to contain the process to the extent that there are crowded living conditions but very few slums.”⁴ This is most likely due to the way they channel the migrants to smaller or medium sized urban areas through *hukou*, which is a household registration system. Perhaps the “Sustainable Urban Development and Management” program has been successful in sharing knowledge on spatial planning and land management.

VI. Conclusion

Shahid Yusuf notes that “cities are expensive to retrofit and modify once they are built,” and that China “must factor in resource scarcities right away and use available technologies strategically” (World Bank, 2008, last paragraph). This is a very important point. Although China is currently experiencing rapid economic growth and millions of people are living much better lives after moving to urban areas, there is a need to take a serious look into the future. How will they accommodate high levels of resource depreciation and environmental issues?

Urbanization is taking up large amounts of land needed for agricultural production and food security. At the rate of the current urban expansion, the government’s designated food security “bottom line” of 120 million hectares of farmable land will approach in the near future (Bai, Chen and Shi, 2012). Between now and 2025, it is estimated that another 200-250 million people will move to China’s cities (World Bank, 2008). Will China’s cities be able to continue to accommodate this many people? All of this is a lot to consider, but is necessary in preparation for a successful future for China.

Perhaps, the most important part of managing urbanization is giving policymakers, municipal staff and all those with power to govern urbanization the skills to deal with the situation at hand. As shown in this article, there are already many programs which are targeted towards teaching city officials how to deal with these issues. Furthermore there are programs on spatial planning and on how to deal with other emerging challenges in China. If these programs are effective, there is potential for sustainability. If the leaders start today to make decisions concerning the future of China, there is much promise for sustained growth and development.

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