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## Whither China's urbanisation? Patterns of development and problems

### Abstract

Since economic reforms started in 1978, urbanisation in China has been taking place at a faster rate than ever before. This recent urban development is characterised by overcrowded agglomerations, fast-growing small-medium cities, imbalance in regional development, widening rural-urban disparities, urban housing shortage, heavy traffic congestion and serious damage to the environment. This research examines the characteristics of China's urbanisation and the patterns of its development. Although the patterns can be explained by cumulative causation, the trickle-down effect should not be ignored because the effectiveness of trickle-down also depends on the geographical distance. More research is necessary to test which theory can better explain the patterns of China's recent urbanisation development.

This article also studies the environmental impact of China's rapid urbanisation development. It is argued that future growth need not be purchased at the expense of higher levels of pollution. But China is a developing and growing country with many competing claims on public and private resources. Reconciling these claims and prioritising environmental policies requires careful analysis of the economic costs and benefits of urbanisation. At present, the Chinese government's agenda on urbanisation, environment and development in the 21st century is but a visionary concept, which lacks a comprehensive policy framework and realistic implementation measurements. Actions for the next twenty-five years rest on three pillars: harnessing market forces, creating incentives for investment in cleaner urban environment, and developing effective regulation and a legal framework.

**Keywords:** China, urbanisation, population, development, environment.

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## **WAARHEEN NEIG SJINA SE VERSTEDELIKING? ONTWIKKELINGSPATRONE EN PROBLEME**

Sedert ekonomiese hervormings in 1978 het verstedeliking in Sjina geweldig toeneem. Dié land se onlangse stedelike ontwikkeling word gekenmerk deur oorbevolkte agglomerate, vinnig-groeiende klein tot medium stede, ongebalanseerde streeksontwikkeling, groeiende stads- en streekongelykhede, stedelike behuisingstekorte, verkeersknope en groot skade aan die omgewing. Hierdie artikel laat die soeklig val op die eienskappe en patroon van ontwikkeling van Sjina se verstedeliking. Hoewel dit aan die hand van kumulatiewe veroorsaking verduidelik kan word, moet die afwentelingseffek nie geheel en al geïgnoreer word nie, omdat die invloed hiervan afhanklik is van die geografiese afstand. Meer navorsing is nodig oor watter teorie die huidige tendens van verstedeliking die beste sal verduidelik.

Hierdie artikel bestudeer ook die impak van Sjina se toenemende stedelike ontwikkeling op die omgewing. Daar word geargumenteer dat toekomstige groei nie ten koste van 'n toename in besoedeling hoef plaas te vind nie. Sjina is 'n ontwikkelende en groeiende land met baie omvattende aansprake op openbare en private bronne. 'n Versoening van hierdie aansprake en die prioritisering van die omgewingsbeleid vereis 'n versigtige analise van ekonomiese koste en die voordele van verstedeliking. Tans is die Sjinese regering se agenda ten opsigte van verstedeliking, die omgewing en ontwikkeling in die 21ste eeu net 'n visionêre konsep, wat te kort skiet aan 'n omvangryke raamwerk en realistiese implementeringsmaatstawwe. Aksies vir die volgende vyf-en-twintig jaar rus op drie pilare: die inperking van markkragte; die skep van insentiewe vir 'n skoner omgewing; en die ontwikkeling van effektiewe regulasies en 'n regsraamwerk.

**Slutelwoorde:** Sjina, verstedeliking, bevolking, ontwikkeling, omgewing.

## 1. Introduction

An increasing proportion of the rapidly growing world population is attempting to satisfy its economic and social needs within an urban context. The enormous migration of people into towns and cities is producing an uncontrollable urban explosion — an unprecedented increase in population, greater demands on urban infrastructure, higher levels of pollution and a decrease of the non-material (and in some cases material) standard of living.

Urbanisation accelerated towards the end of the 1700s and took place on a substantial scale over the next two centuries. It has become a token of modernisation. The proportion of urban population in the world was 13 per cent in 1900, increasing to 29 per cent in 1950 and to 46 per cent in 1997. This figure is expected to reach 50 per cent by the year 2015 (World Bank, 1999).

Five major forces determine the pace of urbanisation throughout the world:

1) Economic growth and development; 2) technological change; 3) a rapid growth in world population; 4) a large-scale movement of people from rural areas to cities; and, 5) in some countries, a net outward-migration of population from cities to towns and villages. As a result of continuing increases in world production of goods and services, improved transportation and the supply of power, production becomes more rather than less concentrated in those locations offering the greatest comparative advantages, increasingly so in large metropolitan-centred market areas. This trend is compounded by the simultaneous growth of large, often multinational, companies, which, with their increasing market dominance and internal and external economies, form an interdependent relationship with areas of large populations and high purchasing power (Balchin, Isaac & Chen, 2000).

Over the past 50 years, almost all developing countries have experienced rapid urban growth. China is the world's most populous country. Its rapid urbanisation since economic reforms started in the late 1970s has a significant impact on world urbanisation trends and it is changing the shape of the world's urban population pattern.

This article examines the characteristics of China's urbanisation and the patterns of its development and raises the argument of which theory of urban economics could provide a sound explanation for the Chinese patterns. This article also studies the environmental impact of China's rapid urbanisation development and suggests the direction of implementing realistic measurements to control the negative environmental impact. The urban areas investigated in this article include both cities and towns consisting of both central and suburban districts.

## 2. The development of urbanisation worldwide

The average growth rate of the urban population worldwide was 8 per cent for the period 1970 to 1996. The proportion of the urban population in the world was on average 46 per cent in 1996, while it was over 70 per cent in developed countries but below 55 per cent in developing countries. Although the percentage of the urban population in developing countries was lower, developing countries were no doubt a major contributor to the growth of urban population in the world over the past 30 years, because urbanisation in most of the developed countries was mature with an average population growth rate of less than 5 per cent. Almost three-quarters of 2.6 billion people living in urban areas in 1996 were in developing countries worldwide (World Bank, 1999). Table 1 indicates the growth of the urban population in some significant countries worldwide over the past 30 years.

Table 1: Urban population growth worldwide (%)

Country	1970	1975	1980	1985	1990	1996	% change (1970-96)
Canada	76	76	76	76	77	77	1
France	72	73	73	73	74	75	1
UK	89	90	89	92	89	89	1
USA	74	74	74	74	75	76	2
Japan	71	76	76	77	77	78	7
India	20	22	23	26	27	27	7
Thailand	13	15	14	20	23	20	7
China	17	17	20	24	26	31	12
Indonesia	17	19	22	25	31	34	17
Philippines	33	36	37	40	43	53	20
Malaysia	27	31	34	38	43	54	27
<b>World</b>	<b>37</b>	<b>38</b>	<b>40</b>	<b>41</b>	<b>50</b>	<b>46</b>	<b>8</b>

Source: *World Development Indicators*, compiled from various issues, the World Bank

Among the developing regions, which have experienced fast urban growth, the Asia-Pacific Rim has had the sharpest increase in urban population as a result of industrialisation (Olds, 2001). The average increase in the percentage of the urban population in this region over the past 25 years was more than 15 per cent.

### **3. The development and current status of urbanisation in China**

Urbanisation in China has been driven by economic development, but it has also, and perhaps more importantly, been influenced by political changes. This was particularly evident from the 1950s to the 1970s when the rate of urbanisation fluctuated markedly. However, substantial growth has occurred since the start of the economic reforms in 1978. Since then, urbanisation has experienced rapid growth in line with the pace of economic development.

Although China's urban population increased from 11 per cent of the total population in 1949 to approximately 31 per cent in 1999 (CSSB, 2000), it was still lower than the world average of approximately 50 per cent in 1999, and even below the 35 per cent norm for countries with similar *per capita* incomes (calculated on a purchasing power parity basis) (Olds, 2001 ). The rate of urbanisation is still at an early stage.

#### **3.1 Urban population growth**

When the Communist Party came into power and established the People's Republic in 1949, considerable investment was made in urban construction to improve living standards and create job opportunities in urban areas. The period from 1949 to 1957 was characterised by the migration of population from rural to urban areas due to economic development. The urban population increased from 11 per cent in 1949 to 15 per cent in 1957. The period from 1958 to 1960 witnessed the 'Great Leap Forward' when the government wished to boost the country's industrialisation by using political power to move people from rural to urban areas to facilitate industrial production. During this period, 19 million people from the rural labour force migrated to cities. As a result, the urban population grew to 20 per cent of the total by the end of 1960.

The natural disasters that occurred between 1961 and 1965 and the collapse of overheated industrial development had a negative impact on the national economy. The government, therefore, forced a proportion of the urban labour force back to

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the rural areas. More than 20 million urban residents were moved to rural areas, causing the urban population to drop from 20 per cent in 1960 to 17 per cent in 1965. Urbanisation decreased from 1966 to 1977, a period marked by the Cultural Revolution. The government concentrated on the power struggle, and invested substantially in national defence. Economic development and urbanisation were put on hold. The percentage of the urban population remained almost unchanged, due partly to the fact that government sent some middle-school graduates to work in the rural areas to be 're-educated' by the farmers.

Urbanisation in line with the pace of economic development really took off in 1978 with the implementation of economic reforms. The government increasingly invested up to 30 per cent of the country's GDP in urban construction (Chen, 1998). Urbanisation thus flourished and peaked at the end of the twentieth century with the urban population increasing substantially from 18 per cent in 1978 to 31 per cent in 1999.

The urban population is unevenly distributed in the city centre and suburban area. This is especially the case in large cities, evidenced by too many people living in the city centre, leaving the suburban districts under-developed (Figure 1).

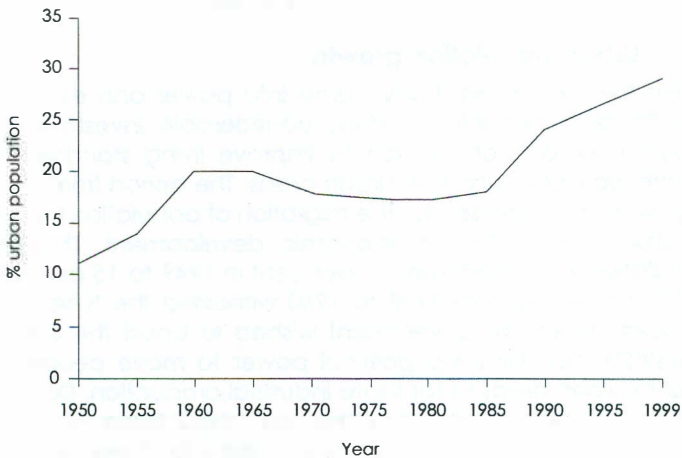


Figure 1: Urban population growth in China (1949-1999)

Source: *China Statistical Yearbook*, various issues (from 1995-2000), China's State Statistical Bureau

Table 2: Population distribution in major cities in China (1999)

City	Population city central/urban (%)	Area city central/urban area (%)
Shanghai	74	30
Wuhan	72	56
Shenyang	72	27
Beijing	67	26
Tianjin	65	35
Harbin	56	9
Nanjing	52	15
Xi'an	46	11
Chongqing	38	26
Guangzhou		19

Source: *China Statistical Yearbook*, various issues, China's State Statistical Bureau

Table 2 illustrates the trend of population distribution in the ten most populous cities. The worst case is Shanghai; the central district contains 74 per cent of the city's population in 30 per cent of the total city area. The imbalance in the distribution of urban population in the city is the result of people wishing to live close to their workplace and public facilities including shops, schools, hospitals, libraries and recreation facilities. Public facilities are considerably better in the central areas. This also reflects poor transportation and lack of public spending to improve the infrastructure.

### 3.2 The growth of small and medium cities

In China, the scale of cities is divided into three groups according to the residential population: large cities with populations of over 1 million; medium cities with populations of between 0.2 million and 1 million; and small cities with populations of less than 0.2 million (Ravallion & Chen, 1997).

The development of urbanisation has been evident not only from the expansion of existing cities, but also from the emergence of newly built cities. There were only 164 cities and towns in China in 1955. This figure increased to 193 in 1978, and to 887 in 1999 (Figure 2).

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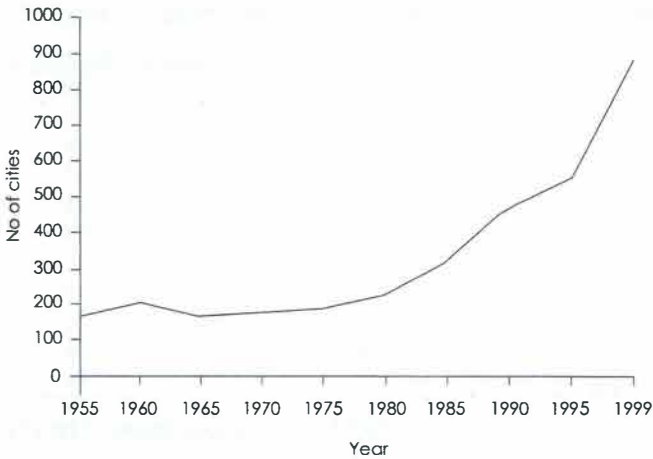


Figure 2: Number of cities in China (1955-1999)

Source: *China Statistical Yearbook*, various issues (from 1995-2000), China's State Statistical Bureau

An important feature of recent urbanisation in China is the deceleration in the development of large cities and the rapid increase in the number of small and medium cities. Table 3 indicates that whereas the percentage of large cities with a population of over two million dropped from 25 in 1978 to 19 in 1999, the percentage of small cities with a population of less than 0.2 million increased from 14 to 24. These small new cities mainly developed from former rural areas. As rural farmers benefited from the economic reforms, they turned their agricultural activities into small-scale industrial concerns. Their living standards improved, and their environments changed from rural to urban (Table 3).

Table 3: Scale of the cities by population (per cent) (1978-1999)

Year	Total	>2 million	1-2 million	0.5-1 million	0.2-0.5million	0.2 million
1978	100	25	12	25	24	14
1980	100	26	12	25	24	13
1985	100	25	15	19	24	17
1990	100	23	19	12	24	22
1995	100	20	15	14	29	22
1999	100	19	13	15	29	24

Source: *China Statistical Yearbook*, various issues (from 1995-2000), China's State Statistical Bureau



This change was also partly due to the fact that the government exercised strict control over the development of large metropolises, and encouraged the development of medium-sized cities. The percentage of medium-sized cities with a population of more than 200 000 and up to 500 000 increased from 23 in 1978 to 29 in 1999. It may be assumed that large cities have reached their optimum population size. In theory, this would mean at a level of population either where net *per capita* benefits were greatest, or where social welfare was maximised. This is illustrated in Figure 3, whereas the optimum city size from the point of view of private welfare would have been at point A (where the distance between the AB and AC curves was greatest), the optimum size from the point of view of social welfare would have been at point B (where marginal costs and marginal benefits were equal). Beyond B, there has been a tendency for urban populations to increase to point C (where  $AC = AB$ ), but thereafter the case for curbing the growth of large cities becomes unassailable since the costs of congestion, pollution and noise etc would have increasingly exceeded the benefits of size (i.e.  $AC > AB$ ) (Alonso, 1971).

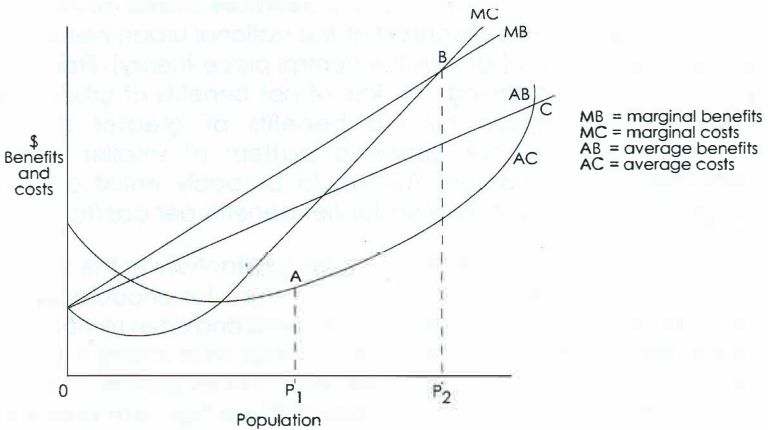


Figure 3: The benefits and costs of city size (Source: Alonso (1971), *The Economics of Urban Size*, Regional Science Association, Papers, 26)

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Since research has shown that average costs reach a minimum point at a population size of approximately 500 000 inhabitants (Vanhove & Klassen, 1980; Begovic, 1991), and since, by extrapolation, it can be assumed that marginal benefits and marginal costs are even when population reaches (say) 1-2 million, it can be concluded that, with further population growth nationally, the expansion of a large number of smaller cities (with populations still below their optima) would generally be preferable to the over-concentration of resources in the largest centres of population.

In practice, criticism has been levelled at the optimal city size theory. One objection is that many urban costs and benefits are related to factors such as density, industrial structure or road layout rather than city size itself. Some research has shown, for example, that polycentric rather than monocentric cities are less prone to problems of congestion (Gordon, 1987). Urban economic structure may also influence optimal city size. Research has suggested that the optimum from the point of view of business services, for example, may well be larger than the optimum for manufacturing or construction services (Begovic, 1991).

This theory gives no indication of the desirable spatial distribution of the population in the context of the national urban hierarchy, unlike other theories (such as the central place theory). From the point of view of planning, the loss of net benefits of urban size may be outweighed by the benefits of greater spatial accessibility if a more dispersed pattern of smaller urban settlements is considered. This would probably entail a wide range of city sizes with fairly similar net benefits *per capita*.

Given that average costs seem to rise substantially in the largest conurbations there would be a strong case for encouraging a settlement structure of medium-sized towns and cities rather than one involving only a few large cities. While productivity may be higher in large cities, as we have seen, the evidence is not so compelling as to suggest any substantial loss from encouraging smaller urban sizes. Perhaps a few major capital cities with significant international functions (for example, London, Tokyo, and New York) may have to remain very large in order to fulfil their world roles effectively. However, there must remain a question mark over the economic and social viability of burgeoning mega-cities of the developing world.

Recent research examining Pacific Rim mega-cities showed that large cities in the Pacific Rim, for example, Hong Kong and Shanghai, have played very significant roles in cultural change and economic development (Olds, 2001). However, the recent experience of declining cities in many developed countries may perhaps suggest that the agglomeration economies of the past are now much less significant (Balchin, Issac & Chen, 2000). The number and size of large cities in the developed world remained almost constant (UN, 1991), whereas in 1970 there were only five mega-cities or urban agglomerations with a population of eight million or more both in the developed world and the newly-industrialising and developing countries (Clark, 1996).

The decrease in the percentage of large cities (with a population of over 2 million) and the decrease in the percentage of some medium-sized cities (with a population of over 500 000) in China may suggest that, at least in the short term, it is not economical to continue to promote the development of large cities. In the longer term, however, technological development and larger-scale infrastructure investment, especially in the provision of housing and transportation, which clearly are current priorities in urban China, may facilitate a reconciliation between optimality and urban growth, particularly where there is a need to perform important functions within a global economy.

### **3.3 Regional trends**

Since the economic reforms in 1978, urbanisation has progressed at full speed in China. The principal issue is whether or not its spatial pattern can be more convincingly explained by the dynamics of cumulative causation or by the trickle-down effect.

The principle of cumulative causation implies that economic development, once established in a city, promotes further local development — the spread effect, but at the expense of surrounding areas or other areas elsewhere — the backwash effect (Myrdal, 1957). From the 1950s to the 1960s, however, it was argued that if appropriate policies were introduced in developing countries, economic growth would spread to backward areas. Hirschman (1958) suggested that even though economic activity and wealth would initially be concentrated or polarised in cities, growth would eventually trickle down to poorer regions, a process further explained by Boudeville (1966) in his interpretation of the development pole theory. Whereas cities would thus play a generative role in economic development and provide the location for import-substituting

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Table 4: Gross Domestic Product by region, 1998

Area	Population (m)	GDP (Rmb trn)	GDP/head(Rmb)	GDP/head(US\$)
Beijing	12.5	201.1	16,080.0	1937.3
Tianjin	9.6	134.1	13,968.8	1,683.0
Hebei	65.7	423.8	6,450.5	777.2
Shanxi	31.7	160.7	5,069.4	610.8
Inner Mongolia	23.4	119.2	5,094.0	613.7
Liaoning	41.6	380.6	9,149.0	1,102.3
Jilin	26.4	156.4	5,924.2	713.8
Heilongjiang	37.7	283.0	7,506.6	904.4
Shanghai	14.6	368.8	25,260.3	3,043.4
Jiangsu	71.8	720.1	10,029.2	1,208.3
Zhejiang	44.6	498.0	11,165.9	1,345.3
Anhui	61.8	282.8	4,576.1	551.3
Fujian	33.0	333.0	10,090.9	1,215.8
Jiangxi	41.9	185.0	4,415.3	532.0
Shandong	88.4	716.0	8,101.8	976.1
Henan	93.1	433.9	4,660.6	561.5
Hubei	59.1	370.4	6,267.3	755.1
Hunan	65.0	321.1	4,940.0	595.2
Guangdong	71.4	793.7	11,116.2	1,339.3
Guangxi	46.8	218.2	4,662.4	561.7
Hainan	7.5	43.9	5,853.3	705.2
Chongqing	30.6	143.4	4,686.3	564.6
Sichuan	84.9	358.0	4,216.7	508.0
Guizhou	36.6	84.3	2,303.3	277.5
Yunnan	41.4	179.3	4,330.9	521.8
Tibet <sup>a</sup>	2.5	7.7	3,080.0	371.1
Shaanxi	36.0	141.0	3,916.7	471.9
Gansu	25.2	87.0	3,452.4	415.9
Qinghai	5.0	21.9	4,380.0	527.7
Ningxia	5.4	22.7	4,203.7	506.5
Xinjiang	17.5	111.5	6,371.4	767.6
<b>All China<sup>b</sup></b>	<b>1,248.1</b>	<b>7,477</b>	<b>5,990.7</b>	<b>721.8</b>

Source: *China Statistical Yearbook 2000*, China's State Statistical Bureau

Note: a, includes military personnel  
b, 1997 figures

industries whose products would be distributed through the city's hinterland, growth points would be established within the more backward regions as centres of new development.

With the rapid development of the economy since the early 1980s, the population of Chinese cities with more than 500 000 inhabitants grew by 30 per cent in the coastal region between 1981 and 1990, by 26 per cent in the inland region and by 18 per cent in the border region over the same period (Li & Tang *et al.*, 2000). However, taking into account the outer-urban areas, the difference in urban growth between the coastal region and the inland region becomes greater, 36 per cent as against 31 per cent (UNCHS, 1998). This suggests that industrial and urban development is concentrated in those areas, mainly in the coastal region, that afford the greatest economic opportunities. By the late 1990s, large tracts of coastal China's so-called rural areas developed a new dispersed pattern of urbanisation. In three regions — the Pearl River delta, the lower Yangtze, and the Beijing-Tianjin-Tanshan metropolitan areas — industrial and commercial activities transformed the landscape, forming urban and peri-urban corridors linking core cities (Cai, 1996). The coastal areas have been able to achieve far more rapid growth, tap that territory's wealth of capital, technology and entrepreneurial skill, create a boom in foreign investment, and yield high GDP per head (Table 4).

It seems that the patterns of recent urban development in China follow the cumulative causation. The fact that the inland regions have lagged behind suggests that the hope that development in the coastal areas would trickle down to the inland regions has not been achieved. But the trickle-down has not been entirely misplaced due to the fact that ten million migrant workers sent remittances home although the impact of the remittances is very limited. Capital drainage out of the poorer regions to invest in the coastal boomtowns has been criticised. In 1997 a serious effort to draw investment, both domestic and foreign, into central and western China, was somewhat successful (EIU, 2000).

The effectiveness of trickle-down also depends on the geographical distance. The large scale of China's geography demonstrates this importance. The trickle-down effect tends to weaken as the distance increases. The fact that the poor inland region is situated very far from the booming coastal area may suggest that the inland area is out of the radius range of the trickle-down effect. When the central government opened the

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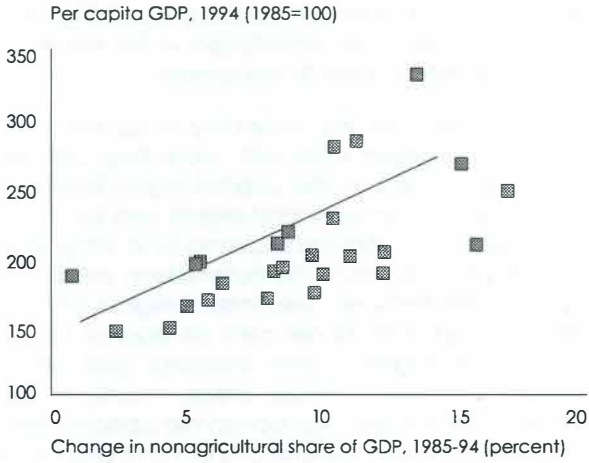


Figure 4: Provincial growth and structural change

Source: World Bank estimates in *China 2020*

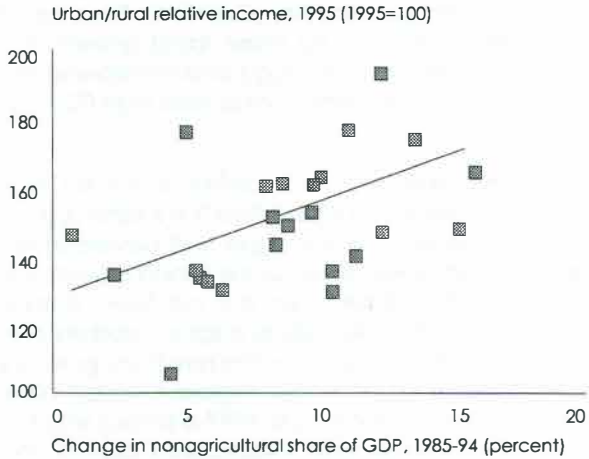


Figure 5: Rural-urban disparities

Source: World Bank estimates in *China 2020*

coastal area and gave them more preferential policies, the inland region did not receive similar treatment (Yusuf, 1994). Since 2000, the central government realised this problem and is now implementing the Great Northwest Development Scheme (EIU, 2000), with the aim of opening another centre to stimulate regional economic development.

It is not very clear yet whether the patterns of recent urbanisation in China follow the cumulative causation or the trickle-down effect. More research is required to test which theory can better explain the patterns of China's recent urbanisation development.

### **3.4 Rural-urban disparities**

Swift economic growth entailed rapid structural change. In this respect China followed the path of many other countries (Chenery & Syrquin, 1975). 'Push' and 'pull' factors have accelerated the flow of labour out of agriculture. Low incomes from farming and widespread poverty in rural areas have encouraged farmers and their families to leave. At the same time, the demand for labour has increased sharply in industry and services, especially among collectively owned enterprises that have achieved rapid productivity growth (Lin, 1992). Structural change boosted China's growth over the past twenty years (Chow, 1996). As the majority of the agricultural labour force was underemployed, productivity rose as workers moved from low-productivity agriculture to more productive employment in industry and services (Jefferson & Gary, 1999).

The process of structural change differed from region to region (provinces), exacerbating inter-provincial and especially rural-urban differences in income (Chow, 1996). Faster growth in the regions meant faster structural change (Figure 4), which, in turn, widened rural-urban disparities (Figure 5) that were responsible for most of the increase in income inequality (Figure 6).

In regions that industrialised faster, higher wages in urban and peri-urban areas opened a growing gap between urban and rural workers. Restrictions on rural-urban migration helped maintain this gap, which was responsible for much of the sharp increase in income inequality over the past decade. Today urban incomes are as much as four times rural incomes, once subsidies enjoyed by urban residents are taken into account (World Bank, 1997a). Such rural-urban gaps are very high by international standards. Evidence from 36 countries shows that the ratio of urban to rural incomes tends to be below 1.5 and

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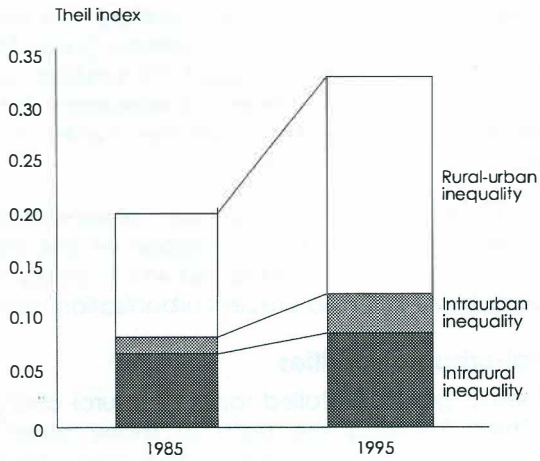


Figure 6: Increase in income inequality

Source: World Bank estimates in *China 2020*

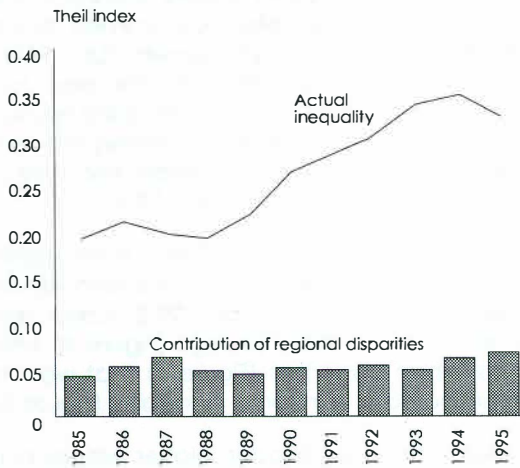


Figure 7: Share of regional disparities inequality

Source: World Bank estimates in *China 2020*



rarely exceeds 2.0 (World Bank, 1997a). In China the gulf between rural and urban residents explains 60 per cent of overall income inequality. On the other hand, regional income disparities have contributed relatively little to inequality (Figure 7).

Nevertheless, China is more egalitarian than most countries in Africa, Latin America, and even the rest of East Asia. But China's steep rise in inequality is exceptional from an international perspective (Figure 8).

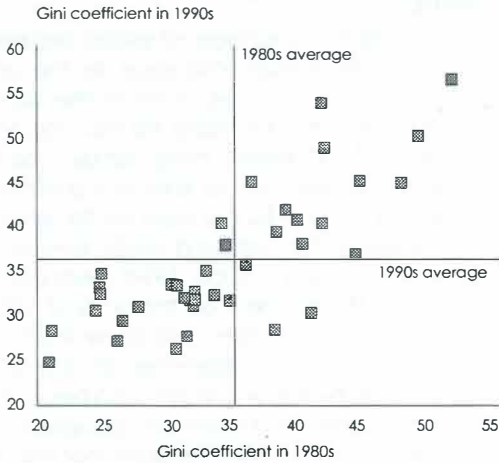


Figure 8: China's inequality in the 1980s and 1990s (Deiningen & Squire, 1996)

Note: The sample of countries was restricted to those designated as having high-quality data, with observations in the early 1980s and early 1990s.

In the early 1980s China's income inequality was below average in a sample of 40 countries for which data are available (Deiningen & Squire, 1996). The sample of countries was restricted to those designated as having high-quality data, with observations in the early 1980s and 1990s by the World Bank. By the 1990s it was above average.

### **3.5 Problems associated with urbanisation**

Although the percentage of the urban population in China is below the world average, in absolute terms it was 377 million in 1996, which accounted for 14 per cent of the world total (World Bank, 1999). While living standards have improved generally, there has been a shortage of residential housing, an increase in traffic congestion and a serious damage to the environment. At present, China is one of the most polluted countries in the world.

#### **3.5.1 Residential housing**

Rapid urbanisation has resulted in a shortage of urban housing, which has been a major social and economic issue. By the end of 2000 the floor space *per capita* was only 7 m<sup>2</sup> in the urban area (CSSB, 2000). Almost 24 per cent of families still had too few rooms. Most of the housing in Chinese cities lacked basic facilities. In the early 1990s only 60 per cent of flats had a kitchen (Chen, 1997), although this improved to 80 per cent by the end of 2000 (EIU, 2000). Further, the size of flats (often a small number of multifunctional rooms) were very small (DoE, 1994). Access to sanitation in urban areas was 68 per cent by the end of 2000, much lower than that in developed countries and lower than the world average (EIU, 2000). Since the beginning of the 21st century, people's living conditions have greatly improved the demand for urban housing in China. Furthermore, people seek not only the quantity of floor space, but also the quality of houses with good conditions and better environment.

The government used to bear the costs of housing construction and maintenance. However, given fewer financial resources available to government, it can no longer incur these costs. Therefore, a housing reform programme, including the privatisation of residential housing, was announced in 1984. However, the reforms have proved disappointing and have failed to generate enough sales. The government set the housing prices too high as it wanted to generate more revenue from the sale, and people's ability to buy was limited by the lack of financial mechanisms.

#### **3.5.2 Traffic congestion**

The increasing demand for public urban infrastructure, including roads, shops, schools, hospitals, libraries and recreation facilities, has not been met. The worst problem is an inadequate road system, which causes traffic congestion.

Table 5: Traffic and congestion in China

	Motor vehicle	Passenger cars	Road traffic	Traffic accidents
Year	Per 1000 people	Per 100 people	Million vehicle km	People injured or killed per 100 vehicle
1980	2	-	2,032	12
1996	8	3	165,000	22

Source: World Bank 1999

Traffic congestion is steadily worsening. Table 5 shows that road traffic increased 80 times between 1980 and 1996. Traffic accidents in China almost doubled over this period (from 12 to 22 people injured or killed per 100 vehicles), compared to the world average of 14 people injured or killed per 100 vehicles. Although ownership of cars in China increased from 2 per 1 000 people in 1980 to 8 per 1 000 people in 1996, it was much less than the world average (121 per 100 people in 1996). This suggests that inefficient traffic management was the main reason for the increase in traffic congestion and accidents.

The expansion of economic activity has contributed to the transportation of goods and services by road over greater distances. These developments have increased the demand for roads and vehicles, adding to urban congestion, air pollution, health hazards, traffic accidents and injuries.

### 3.5.3 Environmental problems

Over the past two decades urbanisation, industrialisation and an increase in the number of vehicles have seriously damaged the quality of air and water. China's air and water, particularly in urban areas, are among the worst polluted in the world. China's extreme dependence on coal and the booming cities are the two forces responsible for much of China's environmental degradation, and this issue will remain crucial into the next century (World Bank, 1997b).

#### *Air pollution*

Sulphur dioxide emissions have soared in China since 1980. Ambient levels of particles and sulphur dioxide are now among the highest in the world (Figure 9). Ambient lead levels are also rising. Recent evidence suggests that half the children in parts of Shanghai suffer from high levels of lead in their blood.

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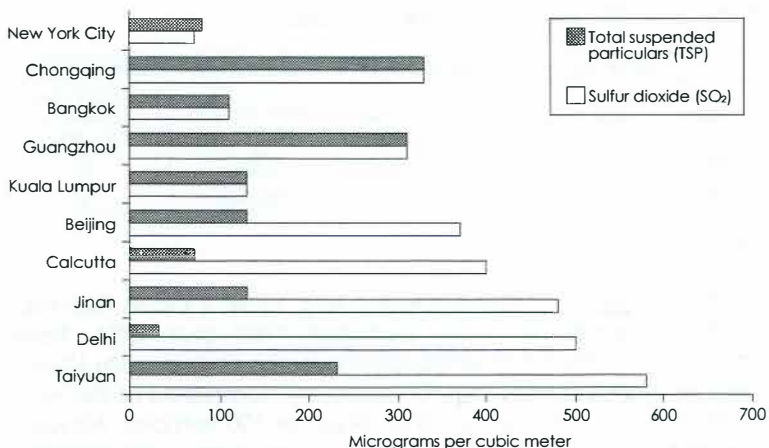


Figure 9: Air pollution in selected cities (Source: World Bank, 1997b)

Note: By WHO standard the total suspended particulates level is  $90 \text{ mg/m}^3$ , and the sulphur dioxide level is  $25 \text{ mg/m}^3$

Small and relatively inefficient coal-fired industrial boilers, residential use of coal and increased automobile use are responsible for the bulk of China's urban air pollution. The latter is obviously bad for health. Mortality rates from chronic obstructive pulmonary disease, the leading cause of death in China, are five times those in the United States. This extra burden strains China's health care system and results in lost working time equivalent to 7.4 million person-years each year. Acid rain is another costly by-product of air pollution. Acid rain causes crop damage, deforestation, structural damage to buildings, and harm to human health. These consequences have been particularly severe in southern China, where high-sulphur coal is burned in large quantities (World Bank, 1997b).

### *Water pollution*

Industrial and municipal waste, as well as chemical and organic fertiliser runoff are the main sources of water pollution in China. Reported discharges of effluent have increased moderately since the early 1980s, with municipal waste accounting for a rising share of total discharges (Figure 10). But the total increase is probably much larger, since sources in the rapidly growing non-state sector are monitored only sporadically. The rising share of municipal waste is of particular concern, since less than 20 per cent is treated (compared with nearly three-quarters of industrial waste).

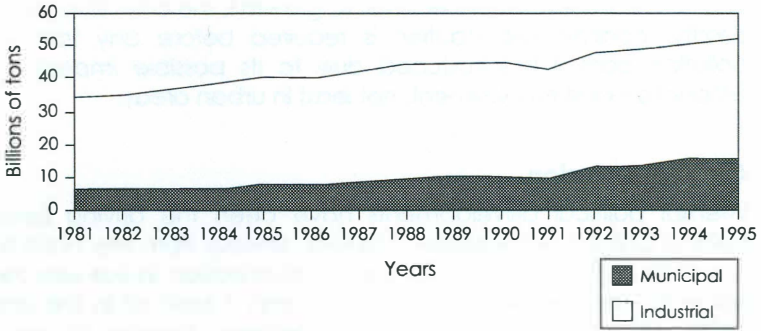


Figure 1 0: Waste water discharges in Chinese cities (1981-1995)  
Source: World Bank, 1997b

Although water pollution is linked to many diseases, its health impact in China has generally been contained by widespread access to safe drinking water. Still, increasing pollution has raised the costs of providing drinking water. In many cities households must boil their drinking water, which is far more costly than centralised chlorination. The more serious concern in respect of water pollution is that it aggravates China's water shortage. Water pollution exacerbates water shortages in cities and towns, and increased water supply and consumption tend to result in greater water pollution unless effluent is treated.

As far as both air and water pollution in China and elsewhere are concerned, it is normal for the marginal benefits gained by the culpable producer to diminish as output increases, and for the marginal external costs in the economy as a whole to increase. From the point of view of society, the optimal solution is for production to take place up to a point where diminishing marginal benefits to the producer are equal to the increasing marginal external costs to the city. To prevent marginal external costs from exceeding marginal benefits, production can be stabilised and pollution abated by one or by a combination of methods, namely:

- Establishing an environmental protection agency to ensure that 'externalities' are 'internalised'
- Regulating the emission of pollutants and the setting of standards
- Subsidising the reduction in pollution
- Taxing pollution
- Introducing tradable permits that enable producers to sell or auction-off the right to pollute.

In China, however, where economic growth is the chief economic priority, considerable caution is required before any form of pollution control is introduced due to its possible impact on production and employment, not least in urban areas.

#### **4. Conclusion**

Internal political developments have been the driving force behind China's urbanisation. This was obvious from the 1950s to the 1970s. Although it has fluctuated urbanisation, in line with the pace of China's economic development, it took off in the late 1970s with the start of economic reforms. Despite its rapid development since 1980, China's urbanisation is still in its initial stage compared with that of the developed world.

China's recent urban development is characterised by overcrowded agglomerations, fast growing small and medium cities, imbalance in regional development, widening rural-urban disparities, urban housing shortage, heavy traffic congestion and serious damage to the environment.

This article examined the characteristics and the patterns of development of China's urbanisation. Although the patterns can be explained by cumulative causation, the trickle-down effect should not be ignored because the effectiveness of trickle-down also depends on the geographical distance. More research is required to test which theory can better explain the patterns of China's recent urbanisation development.

Although urbanisation has dramatically improved living standards, it has resulted in serious damage to the environment. It is argued that future growth should not be purchased at the expense of higher levels of pollution. But China is a developing and growing country with many competing claims on public and private resources. Reconciling these claims and prioritising environmental policies requires careful analysis of the economic costs and benefits of urbanisation. At present, the Chinese government's agenda on urbanisation, environment and development in the 21st century remains but a visionary concept, which lacks a comprehensive policy framework and realistic implementation measurements (State Council 1994). China's handling of the problems resulting from rapid urbanisation was different from that of Western countries. The centrally planned system rather than the market force is still playing a significant role. Action for the next twenty-five years

rests on three principles: harnessing market forces, creating incentives for investment in a cleaner urban environment, and developing effective regulation and a legal framework.

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