

Research of Acceleration Urbanization Impacts on Resources and Environment in Sichuan Province

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Since the reform and opening up, the rapid development of economic society and the rise ceaselessly of urbanization in Sichuan play an important role for material civilization and spiritual civilization, but also bring influence for resources and environment, this paper give an in-depth analysis about this.

I. The Main Characteristics of the Urbanization Development in Sichuan

The reflection of urbanization in essence is from the industry cluster to population cluster., we tend to divided the process of urbanization into four stages, 1949-1978 is the first stage, 1978 – 1990 is the second stage, 1990 -2000 is the third stage, After the year of 2000 is the fourth stage. In view the particularities of the first phase, this paper researches mainly after three stages.

1. The level of the urbanization enhances unceasingly. With the reform and opening-up and the rapid development of social economy, the urbanization in Sichuan has significant achievements. The average annual growth of the level of urbanization is 0.8 percent in the twelve years of the second stage. The average annual growth in the third stage and the four stages is individually 0.5 and 1.3 percentage. The average annual growth of urbanization in the fourth stage is faster respectively 0.5 and 0.8 percent than the previous two stages which reflects obviously the rapid rise of the urbanization after the fourth stage in Sichuan.

TABLE I
The Rate of Urbanization in Sichuan Province

Year	1978	1990	2000	2007
Rate of Urbanization (%)	11.7	21.3	26.7	35.6

2. Regional differences are significant. Static analysis shows the gap of urbanization level is 44.2% among the twenty-one city in Sichuan in 2007. As the highest and lowest city, the urbanization of Chengdu and Ganzi is 62.6% and 18.4% individually. Based on different areas, we can divide these cities into three echelons.

The urbanization level of these cities is more than 50 percent as the first echelon, including Chengdu and Panzhihua city. The urbanization level of these two cities is respectively 62.6% and 58.6% in 2007 which is not only higher 20% than the average level of Sichuan but also higher than average national level.

The urbanization level of these cities is between 30% and 50% as the first echelon,

including Zigong, Luzhou, Deyang, Mianyang, Suining, Neijiang, Leshan, Nanchong, Yibin, Yaan, Guangyuan and Aba, which is lower than first echelon but obviously higher than other cities on the urbanization level.

The urbanization level of the third echelon is below 30% (less than 30% is the primary stage), including Meishan, Guangan, Dazhou, Bazhong, Ziyang. The low economic development level and the weak industry foundation are the typical characteristics of this echelon.

Dynamic analysis shows that the gap of the urbanization level is 11.5% among different regions of the fourth stage. From 2000 to 2007, as a fastest-growing city in urbanization level, Dazhou improves 13 percentage points, and Panzhuhua's urbanization level only improve 1.5 percentage points which is a lowest-growing city.

In the first echelon, Chengdu's urbanization level which qualifies the firstis from 53.5% to 61.5%. In the second echelon, Nanchong, Leshan, Zigong, Luzhou, Yibin speed up with more than the average of Sichuan province, but Deyang, Mianyang is behind the ascending level Sichuan province. Most of cities in the third echelons promote raptly, but a few cities remain relatively slowly.

3. Lateral comparison disparity is great. Compared with the whole country, the gap of the urbanization level in the second stage is from low 6.2 percent down to low 5.1 percent, reducing 1.1 percent. The gap of the urbanization level in the third stage is from low 5.1 percent to 9.5 percent, expanding more than 0.4 percent every year. Although there is small-scope fluctuation, the gap of the urbanization level in the fourth stage is about 10 percent between Sichuan and the whole country.

TABLE II
The Rate of Urbanization of Sichuan and China

	(%)								
year	1978	1990	2000	2001	2002	2003	2004	2005	2006
Sichuan	11.7	21.3	26.7	27.2	28.2	30.1	31.1	33	34.3
China	17.9	26.4	36.2	37.7	39.1	40.5	41.8	43.0	43.9
The Gap Between Sichuan and China	-6.2	-5.1	-9.5	-10.4	-10.9	-10.4	-10.7	-10.0	-9.6

II. The Main Problem of Process of the Urbanization

1. From the demand of view, Sichuan rural population is wide, large and different structure which influences the ascension speed and quality of the urbanization level. Sichuan has 88.15 million people in 2007, including 76% of agricultural population. From 1978 to 2007, urban population grows 2.6 times and rural population reduces 5.14 million. The 21.64 thousand people which is from rural areas to urban is offset about 11 million by the new population. The average education time in the more than six years old people is 7.6 years and illiteracy rate is 8.3% in 2006. From 2000 to 2005, the coefficient of Sichuan ageing population rises 1.1 percent. The population of more than 65 year old, mostly in the rural areas, is 8.6%.

2. From supply view, the number and scale of city and the distribution of industrial structure which are not rational, influence the urbanization process and effect.

(1) Urban distribution is unreasonable, which lead to the weak of radiation function. According to the new five kinds of urban division criterion, currently Chengdu is the only hyper city in Sichuan. Nanchong, Panzhihua, Mianyang and Zigong are the big city. Leshan, Luzhou, Yibin, Deyang, Jiangyou, SuiNing, Guangyuan and Neijiang are the medium-sized city and the rest is small city. With 10.5% land area, the Chengdu plain has twelve cities, and the rest land area is only nineteen small and medium-sized cities in 2007. With nearly 50% land area, the area of Ganzi, Aba and Liangshan is only Xichang city.

(2) Industrial structure is unreasonable, affects the process of the urbanization development. In 2007, the proportion of primary, secondary and tertiary industrial' added value to GDP is 20:43.7:36.3 respectively. The proportion of secondary industry and tertiary industry is totally 80% in Sichuan while the national in 2006 is 88.3%, Shanghai is 99.1%, Jiangsu is 92.9%, and Zhejiang is 94.1%. The proportion of two and Tertiary industries industry in Sichuan is obviously low. The employment proportion of secondary industry and tertiary industry in Sichuan is 47. 9:20.5:31.6 respectively and the total proportion between secondary industry and tertiary industry is only 52.1% in 2007. But the total proportion between secondary industry and tertiary industry is 57.4% in the whole country, and Beijing, Shanghai and Zhejiang is 70%, 93% and 75.6% respectively in 2006.

III. Impact on Resources and Environment of Accelerating the Urbanization Process

Based on the research of the economic development, industrial level and city carrying capacity in Sichuan, it is estimates that improving 0.8 percent annual is more appropriate for the urbanization process. Therefore, with more than rising 1.3 percent each year, the process of the four stages is supra-ventricular which formed the major influence for city carrying capacity and resources and environment.

1. The influence on natural resources.

(1) Construction land is increasing gradually, and cultivated land and per capita cultivated area continue to decline. From 2000 to 2006, construction land is cumulative 64 thousand hectares in Sichuan province, which is equivalent to the 1.6% of cultivated land area in 2006. Railway and highway transportation route length adds 22,000 new kilometers, which covers an area of 11 thousand hectares. Cultivated land decrease 0.43 million hectares. Per capita cultivated land decrease 0.11 Chinese acres and the existing inadequate is about two-thirds of the year of 1978.

(2) Water shortage and pollution problem is getting worse. The surface water of volume of runoff and water savings volume contently decrease. Take Chengdu as an example, the current total impoundment is 1.48:1 billion cubic meters and lower 24.9% than the same period last year. As the major source of Chengdu, Dujiangyan's water resource decrees 8%. The water of the main river, including Minjiang River, Qingyi River, Dadu River, decrees 10% ~ 30%. In 2005, the rate of the urban life sewage treatment is only 30.6%. The rate of the industrial wastewater treatment is only 7.3%. And the success rate of the industrial wastewater discharge is 88.3%.

2. The influence on urban facilities and resources

(1) The influence on infrastructure. Railways in Sichuan province is about 2 thousand kilometers in 2006. And road traffic is 16.5 thousand kilometers, including 85 thousand kilometers grade highway. It is 8.5 public traffic vehicles per million in the eighteen regional cities. The city of highway traffic resource is nervous and bus is crowded. In 2006, per capita public green land area is 8 square meters in eighteen regional urban. The rate of Green coverage is 33.5%. Sewage treatment rate is 49.4%. Household garbage rate is 83.5%. Water penetration rate is 83.5% and coal gas penetration rate is 74.2%. Compared with Other developed provinces, it has a certain disparity

(2) The effect on economic resources. In 1990, the registration unemployment rate is 4% and it is 4.3% in 2007. With the increasing unemployment, the growth of urban residents' income is weakness. From 2000 to 2006, urban residents' disposable income increases 8% which is lower 3% than the national average. Urban and rural residents in Sichuan have 3.98 million people to accept the minimum life guarantee in 2007, which increases 0.18 million compared with the year of 2000.

(3) Impact on energy supply. Once as an energy output province, Sichuan has Ertan hydropower station and large amounts of water and electricity resources. Some cities made many glorious projects in Sichuan, a famous industrial city even built gas-guzzling industrial park. Just a few years later, it faces energy shortages and requires lots of import to solve the problem.

3. Influence on the ecological environment.

Ecological environmental is damaged severely. From the air quality view, the day to reach secondary air quality is less than 300 days in thirteen cities in 2005. From industrial emissions view, industrial emissions and sulfur dioxide emissions reach 813.97 billion cubic meters and 1.05 million tons respectively in 2005, which are both significantly more than the year of 2000. From noise control view, from 2000 to 2005, noise control project increase from 11 to 40 and completion project increases from 11 to 35. Investment cost increases from 1.6 million yuan (RMB) to 9.3 million yuan (RMB). And all kinds of noise pollution are still seriously.

IV. The Countermeasures for Coordinate Development Between Accelerating the Urbanization Process and Resources and Environment

Firstly, it is to improve the understanding, scientific planning, and orderly propulsion. The urbanization construction has dual characterized, and uses lots of resources. Therefore, urbanization is not the sooner the better. Urbanization must match the economic development and resources environment and should base on the existing urban carrying capacity, completes the plan. From land, water, energy, social public resources, we must promote the urbanization pattern from extensive pattern to saving pattern and transform from pursuing unilateral to pursuing quantity. Urbanization should pay more attention to gradual progress, land saving, intensive development, reasonable layout, adjusting measures to local conditions, quality and effect.

Secondly, build up improvement ideas to develop resources and environment. And the urbanization process accompanies with the need of the not flow resources or half liquidity resources, therefore, no matter the province or individual cities of urbanization, should strive to follow this two kinds of resource constraints. Urbanization must absorb United States and

other developed countries' experiences especially on economic cost, environmental costs and social costs and optimize big cities and super big cities' spatial structure. Accelerating urbanization should avoid the way of "resources - products -- pollution emission" or "polluting before management" and insist on the path of sustainable development.

Thirdly, establish the evaluation system of resources environment and early warning mechanism. Because energy consumption per capita of the urban population is about three times as much as the rural population, which decides the rigid characteristics of urbanization, meanwhile, once appear problem is difficult to be corrected. Therefore, establishing monitoring institutions of the urbanization and resource and environment plays an important role in many aspects including controlling and adjusting urbanization structure, accounting, evaluating and warning resources and environment scientifically, punishing violations and promoting the healthy and orderly development of the urbanization.

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ABSTRACT

Urbanization is one of the important symbols to measure social and economic development level for a specific country or region. Since the reform and opening up, with the constant enhancement of Sichuan urbanization level and process acceleration, urbanization plays an important role in promoting Sichuan economic development and solving the three agricultural problems as well as building up a well-off society. Meanwhile, because of rigid requirements on resources, as well as with process accelerating, urbanization has also brought considerable influence on resources and environment. Orderly and coordinated development between urbanization and resources has become a crucially urgent problem. Based on the current status of Sichuan urbanization development, the report summarizes the characteristics of Sichuan and analyzes main problems during the processing of urbanization from different angles of supply and demand. Besides, this report also deeply analyses the influence of urbanization on land, water and other natural resources, roads, transportation and other infrastructure, income, employment, energy and other economical condition as well as the ecological environmental. Meanwhile, this report proposes the measures and related countermeasures about the promoting between urbanization and the resources and environment from all kind of aspects including enhancing understanding, scientific planning, establishing idea of the development and improvement of resources and environment, setting up resource environmental evaluation and early warning mechanism.

This report generates a good social effect when it is issued. It is full-text used by the national bureau of statistics inside and outside website. Besides, this report was full-text used by more than

thirty websites including China Finance Information net, China News net, People net, DRC (Domestic Research Center) net, China Intelligence net. And it is reprinted by West China City News, Chengdu Business, Chengdu Evening, Sichuan Economy Daily newspapers and so on. The southwest financial magazine has published in March 2008. This report wins first prize of the national urban social economic survey in 2007 and it is collected into award essays by the national bureau of statistics,

With extensive content and proper data, this report catches the resources and environment problems which are concerned by the whole society. And this report has outstanding theme, bright views, strong relevance, compact construction and concise text. The countermeasures and Suggestions of this report have some good reference to solve some contradictions and problems in the process of Sichuan urbanization.