

Quality of life (QOL) Research in Mega-city of developing countries---A case study in city of Shanghai

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1. Objective

With the development and the reform and open policy, with the urbanization, China is now experiencing a rapid economic growth. Shanghai is one of the most developed city in China, GDP per capital of Shanghai has reached 11,563 US \$, as shown in Fig 1. According to the standard of UN, cities can be divided into 4 levels: (1) low income city(GDP per capital is below 1,000 US \$) (2) middle income city(GDP per capital is between 1000 and 5000US \$) (3) middle and high income city(GDP per capital is between 5,000 and 10,000 US \$) (4) high income city (GDP per capital is above 10,000 US \$). According to the practice and the development of the cities all over the world, there are 3 city development paths as path A, path B and path C. Fig 2 shows path A, path B ,and path C. Path B is a path that focus on the environment and quality of life, but the economic development stops, path B can lead very quick economic development, but the quality and the livability of the city is low. Path A and path B is not proper for Shanghai .

We should develop and model called path C, which can combine path A and path B, it can consider both economic development and quality of life. At first, we should develop a method to evaluate the quality of the city.

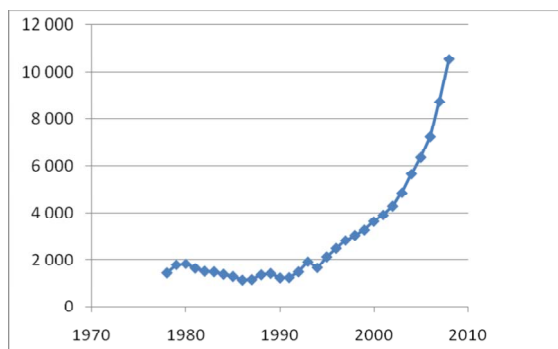


Figure1 GDP per capital of Shanghai(US \$)

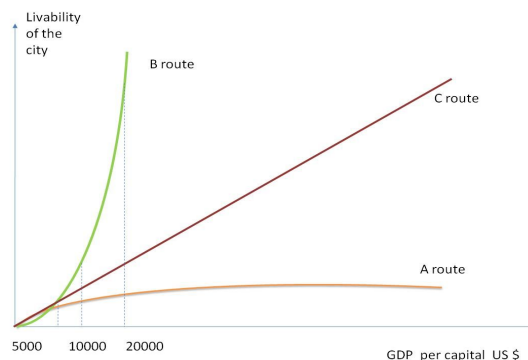


Figure 2 Livability and economic development route

2. General introduction of Shanghai

The area of Shanghai cover is 6340.50 square kilometers. In 2009, permanent population reached 19.21 million, the migration reached 5.41 million. The population density of the whole shanghai is 3030 persons/ square kilometers. In the figure 3, we divided shanghai into 3 areas: (1) inner city area, which is shown as green part in the picture (2) city area , which is shown as brown part in the picture (3)suburb area, which is shown as yellow part in the picture. Figure 3 shows the permanent population density in Shanghai, in the inner part, the density is extremely high, but in the suburb area the population density is extremely low. Figure 4 shows the age structure of Shanghai. The peak of the population age structure is becoming bigger and bigger. Shanghai is now stepping into aging society.

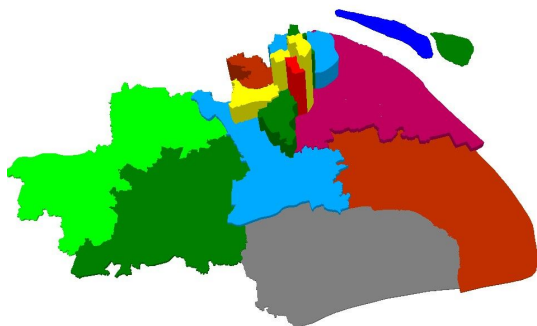


Figure 3 Population density of Shanghai

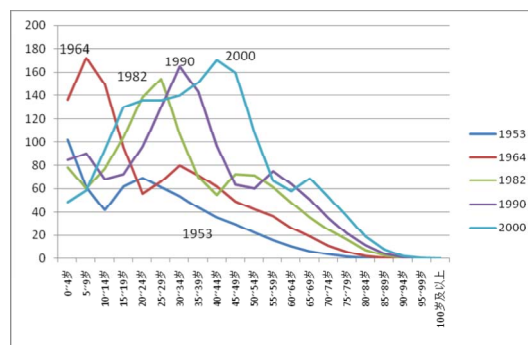


Figure 4 Population age structure of Shanghai

3. Research framework

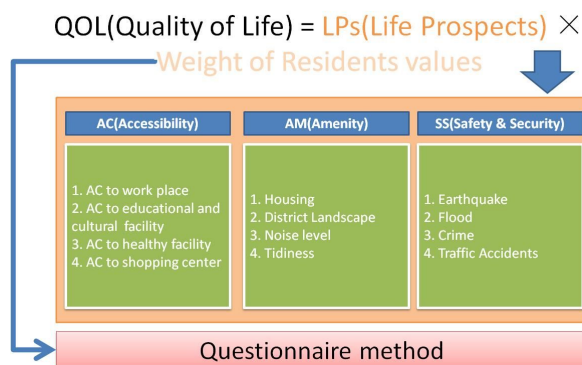


Figure 5 Framework of QOL

	Weight	Attribute	Weight
AC	w_{AC}	Accessibility of commuting	w_{AC1}
		Accessibility of educational and culture facility	w_{AC2}
		Accessibility of health facility and hospital	w_{AC3}
AM	w_{AM}	Accessibility of shopping	w_{AC4}
		Amenity of Housing	w_{AM1}
		Amenity of District Landscape	w_{AM2}
SS	w_{SS}	Noise level	w_{AM3}
		Tidiness	w_{AM4}
		Earthquake, flood, air pollution	w_{SS1}
		Crime	w_{SS2}
		Traffic Accidents	w_{SS3}

Figure 6 Indicator system of QOL

As shown on the Figure 5, the quality is determined by 2 factors: (1) Chance for livability: LPS(Life prospects). It can be divided into 3 parts: a) the convenience of travel b) the comfort ability of the residents c) safety of life; (2) value of residents. Figure 6 shows the indicator system of QOL.

$$QOL_{pl} = \mathbf{w}_p^T \mathbf{LPS}_l \quad (1)$$

$$\mathbf{w}_p^T = [w_p^{AC} \quad w_p^{AM} \quad w_p^{SS}] \quad (2)$$

$$\mathbf{LPS}_l^T = [AC_l \quad AM_l \quad SS_l] \quad (3)$$

Here, QOL_{pl} : the quality of population group p in district l

\mathbf{w}_p : weight (value) of population group p

\mathbf{LPS}_l : Life prospects of district l .

4. Result

At last, quality of life spatial distribution by age, by income are all obtained. The reason of the distribution QOL is also explained.

5. Reference

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