

The study of Quality of life Evaluation System in Hangzhou

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In recent years, along with the rapid economic development of Hangzhou, the public pursue the quality of life "happiness" more and more intensely. In this background of urban development, Hangzhou proposed to build the "Quality of Life of the City" goal fully which covering urban and rural and benefiting all the people, and improved the quality of life for residents of the fundamental starting point of urban development. To make this goal-oriented play better guidance, incentives, and the innovative ideas into practice, the establishment of the Quality of Life Evaluation System in Hangzhou which consistent with the actual Hangzhou and with Hangzhou characteristics is of great practical significance. Based on this theoretical framework, this article is trying to build an evaluation system on quality of life in a more comprehensive evaluation.

I. The Background of Evaluation System

Since the 20th century, with the international concept of sustainable development and national strategy proposed building a harmonious

society, people were paying more attention to the quality of life and the pursuit of happiness. Meanwhile, some experts and scholars for the study were carried out to evaluate the city on the social evaluation index system, such as "the World Bank's Basic Quality of Life Index", "United Nations Development Program's Human Development Index", "World Health Organization Quality of Life Index(WHOQOL)" evaluation index system. Domestic evaluation systems such as "Urban Quality of Life Index", "China's Cities and Life Happiness Survey", "China's Urban Competitiveness Index System ", "Index System for Building a Moderately Prosperous Society", "Harmonious Society Index System " , "Quality of Life-oriented Evaluation System "and so on are evaluated during this period, so as to lay a good basis for further study of "Life Evaluation System of the City".

II. Significance Evaluation System Construction

Quality of life evaluation system not only depends on per capita GDP growth , but also depends on whether people really enjoying the city's quality of life and well-developed quality. Through the evaluation, we can reflect the public's sense of happiness and satisfaction; we can promote economic restructuring and upgrading; we can improve urban quality and create urban brand; we can objectively evaluate the effect of the managers' construction on "quality of life of the city " .

III. Ideas and Principles of Evaluation System

(I) Ideas of Evaluation System

The construction of the "Quality of life Evaluation System" based on improving people's quality of life, and economic, cultural, political, social and environmental " five quality of life " sub-system as the frame, and objective indicators and subjective evaluation as the means, and city, urban district, county (city), industries and so on as the evaluation aspects. And then we carried out the indicators design and analysis the Evaluation.

(II) Principles of Evaluation System

1. The combination of scientific and feasibility. Evaluation system based on "quality of life" concept of development to choose the indicators of innovation. Evaluation system is trying to consider the feasibility of investigation, evaluation, statistics. Indicators are quantified easily. Data is collected conveniently and calculated quickly.

2. The combination of integrity and representation. Use fewer indicators reflecting the quality of life completely and systematically, and make Index system concisely and convincingly.

3. The combination of leading and comparability. Evaluation system should not only reflect the lead of concept that contains "people first" and "quality of life ", but also commonly use general domestic and international index. That can make the evaluation results comparable.

4. The combination of objectivity and subjectivity. Evaluation system

should not only have quantitative measurement and evaluation of economic and social development, but also have to consider people's sense of happiness, satisfaction and other subjective feeling.

IV. The Basic Framework of Evaluation System

(I) The Main Indicators of Evaluation System

According to "quality of life " concept of development, evaluation system that includes economic, cultural, political, social, and environmental elements of the quality of life, nearly pre-choose 200 Index. Through the combination of subjective and objective, combining the method of characterization and quantification , evaluation system has economic life quality, culture life quality, political life quality, social life quality and environment life quality five subsystems. The quality of life evaluation index system includes 5 dimensions, 20 areas, and 50 indicators. In this system , the subjective indicators are 24, accounting for 48% of the total indicators.

1. Economic life quality. Economic life quality that contains 9 indicators is composed by the "family income", "household consumption", " innovation activity "and" innovation performance " four areas .

2. Culture life quality. Culture life quality that contains 13 indicators is composed by the " cultural quality "," cultural entertainment "," leisure activities "," physical and mental health " four areas .

3. Political life quality. Political life quality that contains 7 indicators is

composed by the " democratic decision-making ", " democratic rights", " administration according to law", " legal environment" four areas .

4. Social quality of life. Social quality of life that contains 9 indicators is composed by the " social justice", " social security", " social security", " Social identity" four areas .

5. Environment quality of life. Environment quality of life that contains 12 indicators is composed by the " environmental quality", " residential quality", " travel convenience", " Community Service" four areas .

(II) Indicators and Evaluation Method

1. Quantification of qualitative indicators. 24 subjective indicators which obtained by questionnaire were quantified by membership degree assignment method in fuzzy statistics, divide qualitative indicators into five grades, specify requirements of each grade's content, establish the correspondence between the membership, the evaluation value of satisfaction index was assigned by 1-5 equal portions method for each grade, then weighted aggregation according to their weights which were corresponded to their contents.

2. Quantification and evaluation with the target identified. Through the investigation of individual indicators and quantification of the evaluation system for life quality, we think to apply the generalized index method (commonly known as the relative processing method) is appropriate, the approach is simple, can deal with static evaluation and

dynamic monitoring preferably. The main idea is to determine a standard of evaluation index value (target) firstly, then calculate the ratio of index value and the standard value (target). The method is:

When the index is positive indicator, evaluation value of equivalent (the relative treatment value) is:

$$Z_i = \begin{cases} X_{ki} / X_{mi} & \text{when } X_{mi} \geq X_{ki} \\ 1 & \text{when } X_{mi} < X_{ki} \end{cases} \quad (1)$$

When the index is negative indicator, evaluation value of equivalent (the relative treatment value) is:

$$Z_i = \begin{cases} X_{mi} / X_{ki} & \text{when } X_{mi} \leq X_{ki} \\ 1 & \text{when } X_{mi} \geq X_{ki} \end{cases} \quad (2)$$

in which: X_{ki} is the actual value of the indicator, X_{mi} is the target value of the indicator.

We use the ideal method which is the best usage of generalized index to determine the target value of indicator. According to the "ideal method", the target value of the quantitative indicators is mainly determined on the basis of comparison which were the target value, the standard value of history, the standard value of experience or an ideal value on building quality life; the target value of qualitative indicators is determined by the 85% optimal result of survey sampling.

3. Determination of weights. Here we use the Delphi method to determine the weights. Experts were scoring the weights for the quality

life assessment index system which provided by the task force and covered five dimensions of 20 areas, totaled 50 indicators, then give the final weights.

4. Evaluation method. One is evaluating the realization degree. Here we use FA levels Evaluation Model to assess, FA levels evaluation model is a method which running the factor analysis procedure for each sub-indicators, structuring evaluation factors and the evaluation function, calculating the assessment value of each evaluation unit, then weighted combination the factors' evaluation values of different sub-systems according to a certain weights(To ensure that the factor scores of sub-systems comparable, factor assessment were carried out with the same degree of processing, and the weights were normalized). The formula of specific comprehensive score value (factor total score) of the quality life evaluation index system as below:

$$F = \sum W_i F_i \quad i=1,2,3, \dots, n(\text{sub-system number}) \quad (3)$$

$$F_i = \sum W_{ij}^{F_i} X_{ij} \quad j=1,2,3, \dots, m(\text{sub-system factor number}) \quad (4)$$

In which: F is the comprehensive score of quality life evaluation index system, F_i is the evaluation score of i_{th} sub-system, W_i is the corresponding weight of i_{th} sub-system. X_{ij} is the evaluation value of j_{th} indicator from i_{th} sub-system(through the same degree of quantitative treatment), $W_{ij}^{F_i}$ is the weight of j_{th} indicator from i_{th} sub-system.

Second is evaluating the degree of development. Mainly reflecting the dynamic situation of sharing quality of life.

Compilation method of development indices as below:

$$Z_M = \sum W_{Mi} \times S_i$$

Z_M is quality development index, W_{Mi} is index of leading indicators, S_i is corresponding weights.

When W_{Mi} is positive indicator, the relative treatment is $W_{Mi} = X_{ki} / X_{mi}$. In which: X_{ki} is the actual value of the indicator, X_{mi} is the base value of the indicator. When W_{Mi} is negative indicator, the relative treatment is $W'_{Mi} = X_{mi} / X_{ki}$.

V. Empirical Analysis of the Evaluation Model

In accordance with the model, we measured and evaluated the degree of achievement in quality of life in Hangzhou city. The evaluation result of 2010 shows that the achievement degree of quality of life according to the comprehensive goals in Hangzhou was 87.98%, comparing to year 2007, 2008, 2009, up by 4.69, 3.06 and 0.61 percentage points, respectively. This is in agreement with the residents' subjective experience of life and the survey results, it shows that the empirical analysis of the model is effective, meanwhile we will also make some further improvement and supplement in connection with some problems of the model.

Appendix: Quality of Life Evaluation Index System

Dimensions	Fields	NO.	Indicators
The quality of life in economy	Family income	1	Residents' income
		2	Income satisfaction (subjective)
	Family consume	3	The proportion of service consumption in total consumption expenditure
		4	Engel Coefficient
	Innovation activity	5	The proportion of private economy in total economy
		6	Rate of new product output value
		*7	International openness
	Innovation performance	8	GDP per capita
		9	The Satisfaction of Business environment (subjective)
The quality of life in culture	Cultural quality	*10	The average years of education
		11	Education satisfaction (subjective)
		12	The politeness of citizen
		13	Interpersonal relations satisfaction (subjective)
	Culture and entertainment	14	The proportion of cultural consumption in total consumption expenditure
		15	The Satisfaction of Elegant artistic activities (subjective)
		16	The satisfaction of Cultural Resource Protection and Development(subjective)
	Leisure activities	17	The full extent of enjoying leisure time(subjective)
		18	The Satisfaction of local leisure and tourism activities (subjective)
	Health	19	The Average life expectancy
		20	The proportion of Sports population
		21	The Satisfaction of Medical and health service(subjective)
22		The Self-attention of Mental Health(subjective)	
The quality of life in politics	Democratic decision-making	23	The satisfaction rate of major government decision-making Transparency(subjective)
		24	The satisfaction of Village affairs public(subjective)
	Democratic rights	25	Community (Village) standard rate of autonomy according to law
		26	The Satisfaction of citizens' democratic rights(subjective)
	Administration according to law	27	The satisfaction of Government Administration according to law(subjective)
	Legal Environment	28	The Success rate of people's mediation
		29	The Satisfaction of rule by law environment(subjective)
The quality of Justice	Social Justice	*30	Gini coefficient
		31	The sense of Gap between rich and poor in society(subjective)

life in social affairs		32	Degree of community care for the disadvantaged groups (subjective)
	Social security	*33	Social security coverage rate
		34	Registered urban unemployment rate
	Social safety	35	The number of deaths of production safety accidents per 0.1 billion yuan GDP
		36	The Qualified rate of monitoring on food
		37	The sense of Public security(subjective)
Social identity	38	The sense of belonging in urban area(subjective)	
The quality of life in environment	Environmental quality	39	The decreased rate of synthesis energy consumption per 10,000 yuan GDP
		40	The water quality compliance rate of centralized drinking water source
		41	The number of days of the ambient air above high-quality
		42	Rate of green land of built-up areas
		43	Reduction rate of discharge of major pollutants
		44	The satisfaction of Environment(subjective)
	Residential quality	45	Housing floor space per capita
		46	Village renovation rate
		47	Residential satisfaction (subjective)
	Travel convenience	*48	The convenience rate of urban and rural public transport
		49	The satisfaction rate of residents' traveling(subjective)
	Community service	50	The satisfaction of Community(Village) public facilities and service

*7、 International openness: refers to the actual use of foreign investment, foreign trade and export growth; *10、 The average years of education: replaced with "15 years of compulsory education coverage rate" in counties (cities); *30、 Gini coefficient: replaced with "the ratio of urban-rural incomes" in counties (cities); *33、 Social security coverage rate: refers to the medical, pension, unemployment insurance coverage rate; *48、 The convenience rate of urban and rural public transport: refers to the contribution rate of urban public transport, accessible rate of passenger buses for administrative villages, counties (cities) with "accessible rate of passenger buses for administrative villages".

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