How Far is I “ from being Livable?

—— Evaluation of Livability and Its Influence Factors Based on FAC-Resident Satisfaction

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Abstract: With the continuous development of social economy, people pay more and more attention to the livable level of cities. To create a good living environment is not only the requirement of the government, but also the urgent requirement of the people for the continuous improvement of living standards. Based on this, this paper is the research area, combined with the development status, with economic development, natural environment, convenient transportation, living conditions, cultural environment five aspects to establish the evaluation index system, the design questionnaire survey of the FAC model, calculate the linear weighted score of 0.4270, think the city is now the degree of livable is more livable, the biggest factors for urban economic development, natural environment, and cultural environment.

Keywords: Resident Satisfaction; Fac Model; Urban Livability; And Influencing Factors

1. Introduction

“Cities are places where people live together. In urban construction, we must give top priority to living for the people and leave the best resources to the people.”General Secretary Xi Jinping has repeatedly made important discussions on urban planning, construction and development. At present, there are many studies on the livability of developed cities. In these areas, there is a certain foundation and level of habitable cities, but there is a lack of profound research on underdeveloped cities with slightly lower livable level, and scholars pay less attention to these cities than (Liu Qun, and Du Wenyan,2021). As a developing city in the western region, Alar city in Xinjiang pays more attention to the sublimation of urban development and people’s living experience. Therefore, understanding the current status and shortcomings of Alar city is the core to improve the overall living environment of the city and improve the living quality of residents in an all-round way and multiple fields.

2.Research framework

2.1 Research process

After the establishment of an appropriate evaluation index system, the questionnaire was designed and the data were collected, the questionnaire validity data was analyzed, the authenticity and reliability of the questionnaire were tested, and the FAC model was established to analyze the urban livability of Alar City.

2.2 Construct an evaluation index system

After summarizing the evaluation index system constructed by the study of urban livability in different cities, this paper constructs the index system in combination with the urban development status of Alar city. With economic development, natural environment, convenient transportation, living conditions and cultural environment as the primary indicators, the economic development level: residents’ price satisfaction of housing, water, electricity, catering, clothing, commodities; the natural environment level, urban sanitation, green coverage, air quality and climate satisfaction as the secondary indicators;In the level of transportation convenience, the satisfaction of road condition, airport, railway station and passenger station is taken as the secondary indicators; in the level of living conditions, shopping environment, commodity type, service attitude, housing, medical care, education and social security; in the humanistic environment, community facilities, infrastructure, tourist attractions and citizen civilization degree are taken as the secondary indexes.

3.Survey and analysis of the satisfaction of urban residents in Alar

3.1 Data source and summary

Based on the index system of urban residents questionnaire design, alar residents as the survey volume after recycling for careful screening, eliminate invalid questionnaire, eventually get effective questionnaire 406, respondents including living in alar city local population and temporary population, including different gender, different ages, different level of education, different occupation and different family income groups, coverage is extensive, better shows the universality of the city habitable survey.

Specific information statistics are shown in the figure:

3.2 Test of the reliability of the questionnaire data

Using the data of the scale questions in the questionnaire, the Alpha coefficient showed that the clone Bach Alpha was 0.951 and the clone Bach Alpha based on standardized items was 0.935 (Table 3-1), indicating that the questionnaire has strong reliability and certain research significance(Wu Haikui,2022).

3.3 Validity test of the questionnaire data

The KMO value was 0.903, greater than 0.8, and the significance of Bartlett sphericity test was 0.000 (Table 3-2), indicating that the questionnaire had good validity. In conclusion, the result analysis of the questionnaire is more reliable, true and in line with the actual situation, and the empirical analysis based on the data of the questionnaire is highly convincing.

4.Evaluation of the urban livability level in Alar based on the FAC model

4.1 The FAC mathematical model

Factor analysis model uses the idea of dimension reduction, starting from the study of the dependence of the original variable correlation matrix, and puts some variables with complex relationship into a handful of comprehensive factors analysis method (Jenine K. Harris□ Jason Roche□Amy K. Estlund,2014).

4.2 Factor extraction

The cumulative variance contribution of the three factors extracted from all indicators reached 67.525%, indicating that these three factors are fully representative and are the main factors of this index system. According to the total variance interpretation table, the percentage of the first factor is 52.557% and the cumulative contribution rate is 52.557%; the second factor is 8.541% and the cumulative contribution rate is 61.098%; the percentage of the third factor is 6.082% and the cumulative contribution rate is 67.180%.

4.3 Factor rotation

In this paper, the variance maximum method is used to orthogonal rotation of the factor load array. The rotated factor load matrix is shown in Table 4-4-1. According to the rotated factor load matrix, it can be seen that the extracted common factor is mainly closely related to the original indicators, and the common factor is named (Li Xueming, Bai Zhizhen, Tian Shenzhen,2019).

The specific names are given as follows:

Urban economic environment factor: the first five dimensions of economic development in the index system are classified into a single category, and they are named as the urban economic environment factor.

Urban living environment factor: it means that the natural environment and human environment in the index system are classified into one category, and named as the urban living environment factor.

Convenience factor of urban life: the living conditions, convenient transportation and commodity prices are classified into one category, and named as the convenience factor of urban life.

4.4 Calculate the factor score

According to the table "The component matrix after the rotation", the following functions can be obtained by using the weight of the variance contribution rate of each factor as the objective weight of each factor the same way, we can write the equations for F2 and F3

$$\begin{aligned}F_1 &= -0.173X_1 - 0.080X_2 - 0.040X_3 - 0.035X_4 - 0.091X_5 - 0.111X_6 \\ &-0.097X_7 - 0.055X_8 - 0.061X_9 - 0.103X_{10} - 0.097X_{11} + 0.000X_{12} \\ &+0.018X_{13} + 0.052X_{14} + 0.172X_{15} + 0.087X_{16} + 0.315X_{17} + 0.069X_{18} \\ &+0.221X_{19} + 0.087X_{20} + 0.107X_{21} + 0.070X_{22} + 0.160X_{23} + 0.172X_{24} \\ &+0.114X_{25} + 0.046X_{26}\end{aligned}$$

The variance contribution rate of each main factor is weighted as the weight(Jia Zhanhua, Gu Guofeng,2017), and the comprehensive score is calculated as: $F = 0.4209F_1 + 0.3460F_2 + 0.2331F_3$

According to the calculated comprehensive score, the average value is 0.4270, which considers the livable degree of Alar city more livable.

5. Summary

To improve the livability of the city, any aspect can not be ignored, pay attention to the local economic development, improve the disposable income of ordinary residents, promote the local economic development; strengthen the protection of ecological environment, prevent the disturbance of dust weather, pay attention to the development of ecological and cultural environment. Improve the living standard of residents in (Fu Bo,2011).

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Fund project: tarim university innovation entrepreneurship project "live in, have Ann-alar city livable status and level comprehensive evaluation empirical research (2023187)", tarim university higher education research project "OBE concept course exploration and practice (TDGJYB2022119)", tarim university course education demonstration course "sampling survey (TDKCSZ22429)", tarim university level first-class undergraduate professional "applied statistics (YLZYXJ202211)".