



Evaluation of Urban Habitat Quality Based on Theory of Humanistic - A Case Study of HeFei Metropolitan Circle of China

Xingang Yang^{1,2} , Mengyuan Jin^{1,2}  , and Xueyan Liu^{1,2} 

¹ School of Architecture Planning, Anhui Jianzhu University, Hefei 230000, China
jmy@stu.ahjzu.edu.cn

² Collaborative Innovation Center for Urbanization Construction of Anhui Province,
Hefei 230000, China

Abstract. Under the current requirements of sustainable development, scientific and objective evaluation of the quality of urban habitat and analysis of the influencing factors of habitat quality are of great significance for the implementation of habitat improvement according to local conditions. Taking the HeFei metropolitan circle as a case study, the study uses mathematical statistics and geographic information methods to evaluate the quality of urban habitat from four dimensions: physiological need, safety need, social communication need and self-actualization need, and to analyse The study shows that the quality of urban habitat in the HeFei metropolitan circle of China is not only spatially heterogeneous but also influential. The study shows that: (1) the spatial distribution of urban habitat quality in the HeFei metropolitan circle of China varies greatly, with the quality of urban habitat in the eastern part of the city being significantly higher than that in the western part; (2) the quality of urban habitat is influenced by many factors such as the level of economic development, infrastructure arrangement and ecological civilization construction, among which the level of economic development has a significant impact. (3) The radiation effect of neighbouring cities is of great significance to the improvement of the quality of urban habitat. Through the study and analysis of the index factors affecting the improvement of urban habitat quality, we provide reference suggestions for promoting sustainable urban development.

Keywords: Theory of Humanism · Urban Human Settlement Environment · Quality Evaluation · HeFei Metropolitan Circle of China · Sustainable Development

1 Introduction

The quality of the human habitat, as a fundamental issue for human survival and development, has always been a core issue in urban research, and the urban habitat is becoming one of the hot spots for research in the fields of architecture, geography, environmental studies and planning [16]. The harmonisation of human survival and socio-economic development is of great importance for the sustainable development of society and economy and the construction of a liveable and workable human environment [2]. Since

China's urbanization has entered an accelerated phase, by the end of 2022, China's urbanization level has reached 65.22%, with an unprecedented scale and speed of urbanization. Urbanization is a double-edged sword. On the one hand, in these 40 years or so since the reform and opening up, China has completed the urbanization path of developed countries for more than 100 years, which is a great achievement; on the other hand, the geographical conditions, economic bases, social policies and resource allocation of different cities have not been fully considered in the new urbanization process [3]. On the contrary, the blind pursuit of high speed and over-expansion has brought about more problems, and the coordinated development of cities in terms of comprehensive carrying capacity, safety bottom line, livable quality and humanistic care is relatively insufficient [4]. The city's overdraft of resources, environmental degradation, traffic congestion, ageing before it ages, ageing before it gets rich, and challenges to sustainable development. People's living needs have also shifted from the pursuit of a pleasant physical environment to a greater focus on ecology, culture, security and equity and justice.

Since the 1950s, foreign scholars have been studying the human habitat, and the Greek scholar C. A. Doxiaodis proposed the establishment of a multidisciplinary group of human settlements, namely the "science of the human habitat". Since the Vancouver Declaration of the First Conference on Human Settlements in 1976, habitat as a discipline has received increasing attention from scholars [5]. In terms of research progress, foreign scholars have been focusing on the science of habitat as a discipline. In terms of research progress, foreign scholars have focused on the constitutive systems of the habitat environment, across the spatial scales of regions, cities and communities [6]. In addition, they have built evaluation systems and models mainly from the perspectives of ecology, human-earth relationship and urban planning, extended and deepened the evaluation content, and quantified the suitability of urban habitat environment [8]. The evaluation system and models are developed from the perspectives of ecology, human-earth relations and urban planning.

From the late 20th century, Chinese scholars began to summarise and sort out the comprehensive evaluation of urban environment at home and abroad, and explored different aspects of the evaluation of sustainable urban habitat development. Professor Wu Liangyong proposed a theoretical system of "habitat and environment science [2]. The Habitat environment, proposed by the natural system, human systems, social systems, housing systems and support systems and other five sub-systems, including global, regional, urban, community (villages and towns), buildings and other five levels of academic research on the Habitat environment [7]. It has gradually been developed to an operational level. Domestic research on habitat environment mainly includes the evaluation of the quality of urban habitat environment, the coordination and coupling of the quality of urban habitat environment with a certain development factor, and the influence of the quality of habitat environment on a region or city [8]. Li Shuai uses a combination of hierarchical analysis and entropy weighting to analyze the quality of urban habitat in Ningxia by achieving a more standardized weight distribution [9]. XIONG Ying quantitatively studied the relationship between urban habitat and economic development in Changsha. The main factors affecting the quality of urban habitat in the Shandong Peninsula urban agglomeration were investigated using principal component analysis [10]. XIONG Ying quantified the relationship between urban habitat and economic

development in Changsha, and Dong Zuocheng used principal component analysis to investigate the main factors affecting the quality of habitat in the Shandong Peninsula urban cluster.

“At this stage, how to promote the optimization of urban spatial structure and quality improvement based on the concept of sustainable development has become a major concern. In order to fully implement the new requirements put forward at this stage, and to enhance the quality of urban habitat based on the concept of sustainable development, Anhui Province has issued relevant documents while accelerating the development plan for the HeFei metropolitan circle of China. In addition, the province has accelerated the construction of various economic corridors, expanded Hefei’s transportation map, accelerated its integration into the Yangtze River Delta, and strengthened the Yangtze River Delta’s radiation to the HeFei metropolitan circle of China to achieve a win-win situation for the region. Therefore, this paper takes the HeFei metropolitan circle of China as the research object, and analyses the urban habitat environment in various regions of the HeFei metropolitan circle of China by constructing a habitat environment evaluation system, and scientifically evaluates the quality of urban habitat environment with a view to creating a model for sustainable development of habitat environment, which is of great significance to the development of the HeFei metropolitan circle of China and Anhui Province.

2 Theoretical Foundations and Research Methods

2.1 Theoretical Connotations

Theory of humanism, a philosophical and literary movement that originated in Italy in the second half of the 14th century and spread to other European countries, is a philosophical perspective that also embraces a pragmatic and empirical approach [11]. One of the most prominent figures in humanistic theory was Maslow, who, in his study of human motivation, developed the famous “theory of needs” [12]. He believed that the hierarchy of human needs, in the shape of a ladder, gradually progresses from lower to higher needs, and consists of five major levels: physiological needs, security needs, social needs, respect needs, and self-actualisation needs. Physiological needs are the most basic, strongest, most primitive and most significant of all human needs [12]. Physiological needs after the most basic physiological needs are satisfied, people will further seek the satisfaction of security needs, including psychological security, physical security, environmental security, economic security, etc. Under this psychological need, people generally crave more order and stability. When physiological needs and security needs are satisfied, social needs will become the next level of strong needs, hoping to get support, love and understanding from others, and hoping to conduct social interactions between people. In addition, all people in society have a need or desire for self-esteem, self-respect and respect from others [13]. Finally, when all needs are met, there is a need for self-actualisation in the form of self-development [14].

The ideal urban habitat also responds to the change from low to high level. As the quality of life improves, people are no longer simply satisfied with physiological, safety and other low-level material functions, but have diversified requirements for the habitat,

and increasingly need to meet the psychological perception of people pursuing high-level social activities and attention. The different levels of demand of urban residents are evident in the different stages of socio-economic development of the city in the temporal dimension, and in the spatial dimension, they depend on the coordination and interaction of the various levels of the urban territorial system, such as the background environment, infrastructure and social economy.

2.2 Selection of Indicators

The evaluation of urban habitat takes into account both the hard and soft environments. The hard environment mainly includes material factors, reflecting the physiological needs and security needs of urban residents in Maslow's hierarchy of needs theory [14]. The soft environment, on the other hand, mainly considers the cultural environment, the ease of communication and the employment situation of the residents, which reflect the higher level needs of Maslow's theory of needs.

In summary, based on Maslow's needs theory, the urban habitat environment is evaluated from different aspects and an urban habitat environment evaluation system is constructed [15] (Table 1).

First of all, physiological needs are mainly refers to the material level and can meet the basic needs of survival, such as "clothing, food, housing and transportation".

The first is livelihood security, i.e. the most basic security to live on, which is reflected by two indicators: urban residents' per capita disposable income (RMB) and urban residents' per capita consumption expenditure (RMB); the second is living conditions, reflecting the quality of urban residents' living, which is reflected by the indicator of urban per capita housing area (m^2); the second is basic medical care, which is reflected by the indicator of the number of hospital beds per 10,000 people, which is a good reflection of the level of medical care that cities can provide for their residents. Finally, infrastructure is the hard environment that best reflects the quality of life of urban residents, and is reflected by the two indicators of urban water penetration and urban gas penetration.

The second is the demand for security, that is, a human living environment that is safe, stable, dependable, free from intimidation, in need of order and the rule of law, and in which urban residents have a sense of security. 3 indicator criteria layers were selected as evaluation factors. The first is social security. A social environment with the rule of law and a structured system can well meet people's needs for security, and the number of public security cases per 10,000 people was chosen as an indicator to reflect the safety of the city. Lastly, ecological safety, with the improvement of the economic level, urban residents are paying more and more attention to the quality of the environment and ecological quality of the city, thus giving urban residents a safe ecological environment.

The third is social demand, this paper incorporates respect demand into social demand, mainly to evaluate the social interaction degree of the city's residents, whether the urban habitat environment can meet the needs of residents to obtain emotional value through social interaction, three indicator guidelines layer is selected. First, cultural needs, the number of books in public libraries per capita was selected as an indicator to reflect the cultural environment of the city; Second, social interaction, in the era of rapid development of the Internet, interpersonal interaction occurs more often on the

Table 1. Comprehensive urban habitat evaluation system.

Requirement level	Criterion layer	Indicator layer	Attribute
Physiological needs	Living security	Per capita disposable income of urban residents	+
		Per capita consumption expenditure of urban residents	+
	Living conditions	Urban per capita housing area	+
	Basic medical treatment	Hospital beds per 10000 people	+
	Infrastructure	Urban water penetration rate	+
		Urban gas penetration rate	+
Safety needs	Public security	Public security organs investigate and deal with public security cases per 10000 people	-
	Traffic safety	Traffic accidents per 10000 people	-
	Ecological safety	Per capita green area	+
		Percentage of days when air quality reaches Grade II	+
Social needs	Cultural needs	Public library collections per 10000 people	+
	Social communication	Number of computers owned by every 100 households	+
	Road traffic system	Per capita urban road area	+
Self-actualization	Job opportunities	the registered urban unemployment rate	-
	Salary	Average wage of urban non-private employees	+

Internet, mobile phones, offline environment survey is far less than the online environment can highlight social, the number of computers per 100 households was selected as an indicator, which can better reflect the degree of social contact of urban residents; Third, the road traffic system, whether the traffic is convenient or not, whether the road network density is average or not, all have a greater impact on residents' long-distance social interaction, and the urban road area per capita is chosen as an indicator to map the satisfaction of long-distance social interaction needs.

The fourth is the demand for self-actualization, which is the highest level of demand for urban habitat, and two criteria-level indicators were selected. The first is job opportunities, i.e. the ways in which residents can realize their self-worth and progress towards their ideal state. A high employment rate and low unemployment rate can provide more ways to realize oneself, which is reflected through the negative indicator of urban registered unemployment rate; the second is wage level, i.e. the economic level of urban

residents, which also provides costs for self-actualization, and the positive indicator of the average wage of urban non-private sector employees is chosen to reflect this.

2.3 Research Methodology

This paper adopts the expert scoring method and AHP, according to the constructed index system, inviting experts and professors of the university and some postgraduate students to assign importance data to each different level of key index analysis, placing the data into yaahp, constituting a hierarchical index judgment assignment matrix and passing the data consistency analysis test, assigning weights to obtain the level key indexes in order.

At the same time, the data from the HeFei metropolitan circle of China in 2010, 2015 and 2020 were normalized by the polar transformation method [15]. The original data for each region falls between [0, 1], thus eliminating the effects of magnitude and order of magnitude. Assuming that the value of indicator j in year i of a city is X_{ij} , the maximum value of indicator j is X_{\max} and the minimum value is X_{\min} , the normalization of the indicator can be obtained.

Drawing on relevant studies [9, 16, 17], combined with the evaluation system constructed in this paper, Eq. (1) is derived:

$$HI_i = \sum_{j=1}^m (W_{ij} \times N_{ij}) \quad (1)$$

In the equation, HI_i is the Habitat Index of city i ; m is the number of evaluation indicators j ; W_{ij} is the weight value of the j th indicator; N_{ij} is the normalized value of the j th indicator.

3 Research Cases and Data Sources

Overview of the Study Area: HeFei metropolitan circle of China, located in the middle and lower reaches of the Yangtze River along the western end of the Yangtze River Delta, is one of the five major metropolitan areas of the Yangtze River Delta city cluster, an important hub and western gate of the Yangtze River Delta extending to the central and western parts of the region. The HeFei metropolitan circle of China includes Hefei, Huainan, Lu'an, Chuzhou, Wuhu, Ma'anshan, Bengbu and Tongcheng (county-level cities) in Anhui Province, with a regional area of 40.6% of the province and a population of 43.2% of the province [18]. With the rapid economic growth and urbanization process, the rapid development has also highlighted certain problems, which have a negative impact on the urban habitat. It is therefore of practical importance to analyse the quality of the urban habitat in the region and to give certain suggestions for its improvement (Fig. 1).

Data sources: data for the three time periods of 2010, 2015 and 2020 were selected for evaluation, statistical data for each evaluation index in the evaluation system were obtained from the Statistical Yearbook of Anhui Province (2010, 2015, 2022), other

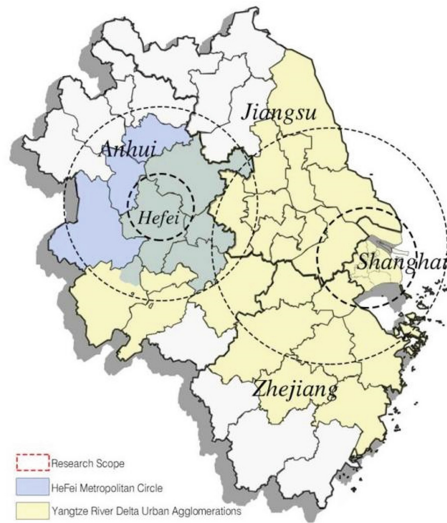


Fig. 1. Administrative map of the Yangtze River Delta city cluster.

data were obtained from the Statistical Yearbook of each city, the statistical bulletin on national economic and social development of each city (2010, 2015, 2022) and relevant statistics released by the government, and the administrative boundary data are obtained from the National Geographic Information Resources Catalogue Service System.

4 Analysis of Evaluation Results

Based on the results of expert scoring, the weights of the indicators in the urban habitat quality evaluation index system were calculated by AHP (Fig. 2), and combined with the normalized values of the indicators from, the scores of each city in the HeFei metropolitan circle of China at different levels of habitat quality and the overall scores of each city were calculated. Using ArcGIS10.3 software, the cities' habitat quality scores at different levels were graded by the natural fracture method (Table 2).

4.1 Results of Urban Habitat Measurement

In 2010, the average score of urban habitat quality in the HeFei metropolitan circle of China was 0.150551, with the highest value of 0.271154 for Maanshan and the lowest value of -0.035967 for Tongcheng, and the average score of 0.317566 in 2015, with the highest value of 0.421153 for Maanshan and 0.235138 for Tongcheng. In 2020, the average score is 0.469378, with the highest value being Maanshan City at 0.543274 and the lowest value being Huainan City at 0.394953. The increase is relatively large.

In order to analyze the spatial variation of the quality of human living environment in the HeFei metropolitan circle of China, each city was divided into five levels: lowest, lower, medium, higher and highest, using the classification criteria in Table 2 (Fig. 3).

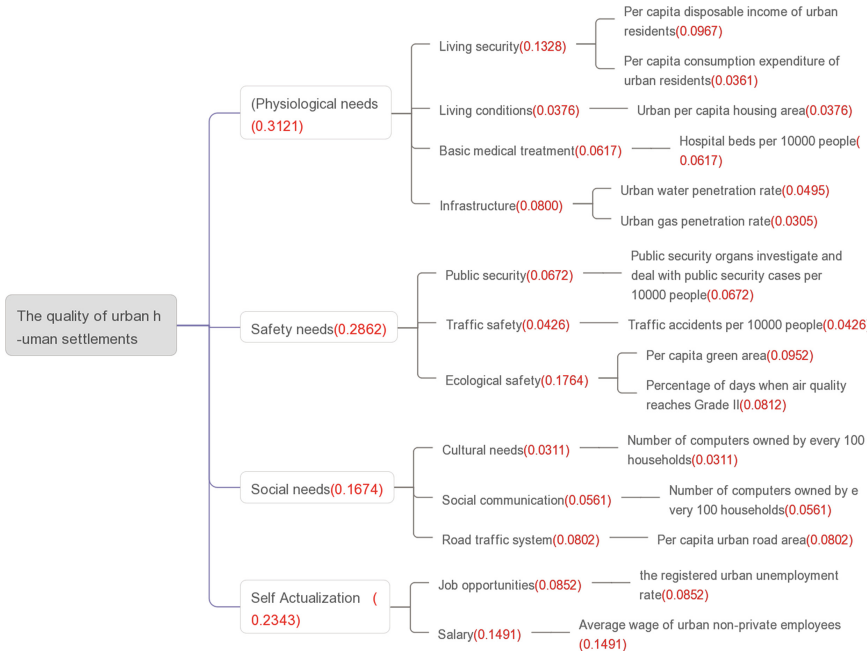


Fig. 2. Weighting of indicators for comprehensive evaluation of urban habitat quality.

The overall results of the comprehensive evaluation (Fig. 4) show that from 2010–2020, Maanshan has a greater overall growth and is leading the way. As can be seen from the figure, the southeastern cities score higher than the northwestern cities overall, especially after 2015, showing a more obvious east-west difference. Among them, Hefei, Maanshan, Chuzhou and Wuhu have been showing relatively high levels of urban habitat quality ratings in this 10-year process. Most of these cities are located in the southeastern part of the metropolitan area and belong to the Yangtze River Delta urban agglomeration, where the cities have higher levels of economic development and configuration of basic service facilities, and the quality of their habitat environment has thus been improved. However, due to the large urban population, there is still a shortage of public facilities per capita, and there is still much room for improvement in the quality of the living environment. The cities of Bengbu, Huainan, Liu’an and Tongcheng are at a lower level. These cities are mainly located in the north-western part of the metropolitan area and belong to the northern and western parts of Anhui. The lack of economic development in these regions has led to inadequate configuration of infrastructure and public service facilities, and the quality of the urban human living environment has yet to be improved.

4.2 Factors Influencing the Urban Habitat

Physical Needs. From the perspective of basic living needs, there are many factors affecting the basic physiological needs of urban habitat quality, mainly including four aspects of living security, living conditions, basic medical care and infrastructure, as

Table 2. Criteria for classifying natural break points for quality assessment in different dimensions.

	Comprehensive score	Physiological needs	Safety needs	Social needs	Self-actualization
Lowest	$-0.035967 < S \leq 0.158490$	$0.128570 < S \leq 0.025550$	$-0.017613 < S \leq 0.000000$	$0.019684 < S \leq 0.032327$	$-0.081806 < S \leq -0.045190$
Lower	$0.158491 < S \leq 0.235138$	$0.025551 < S \leq 0.103029$	$0.000001 < S \leq 0.031733$	$0.032328 < S \leq 0.061005$	$-0.045189 < S \leq -0.011884$
Middling	$0.235139 < S \leq 0.327781$	$0.103030 < S \leq 0.156849$	$0.031734 < S \leq 0.044192$	$0.061006 < S \leq 0.083793$	$-0.011883 < S \leq 0.016005$
Higher	$0.327782 < S \leq 0.465442$	$0.156850 < S \leq 0.208964$	$0.044193 < S \leq 0.063357$	$0.083794 < S \leq 0.110622$	$0.016006 < S \leq 0.055375$
Highest	$0.465443 < S \leq 0.543274$	$0.208965 < S \leq 0.278275$	$0.063358 < S \leq 0.100316$	$0.110623 < S \leq 0.140834$	$0.055376 < S \leq 0.129736$

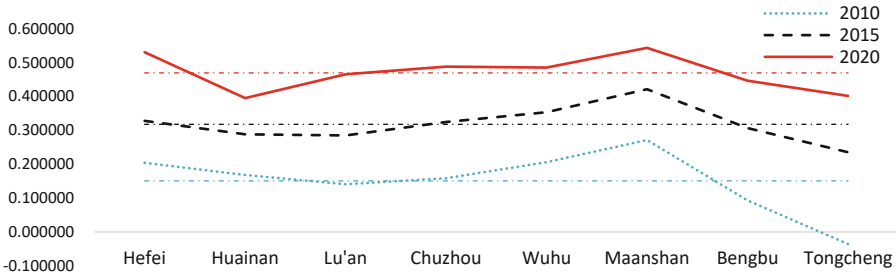


Fig. 3. Results of the comprehensive evaluation of the quality of the habitat environment of the cities in the HeFei metropolitan circle of China

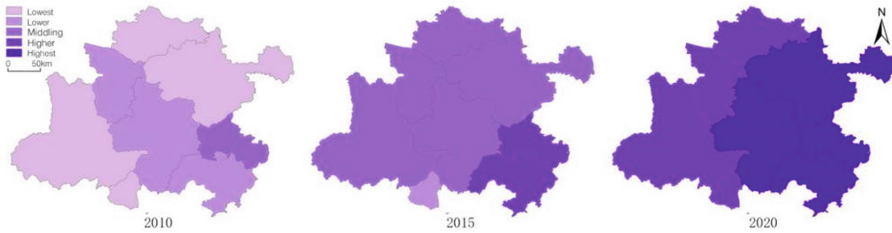


Fig. 4. Regional differences in the comprehensive evaluation of the quality of the human habitat in the HeFei metropolitan circle of China by city

well as six specific quantitative indicators such as urban residents' per capita disposable income, urban residents' per capita consumption expenditure and urban per capita housing area. The results of the physiological demand score for habitat quality show that the overall physiological demand score from 2010 to 2020 is on an upward trend, and the growth is relatively stable. Among them, Hefei has always taken the lead in the physiological needs score, which is inextricably linked to its status as the capital city of the province. In addition, as the centre of the metropolitan area, Hefei, together with Maanshan, Wuhu and Bengbu, is driven by the development of the Yangtze River Delta city cluster, and has a more developed economy and better infrastructure, which makes it more attractive to foreigners, and therefore has a higher and higher rating for the quality of the human environment in terms of physical needs. Lu'an, Huainan and Chuzhou have relatively low scores, mainly due to their large migrant populations and constraints on economic development, which have led to a lower level (Fig. 5).

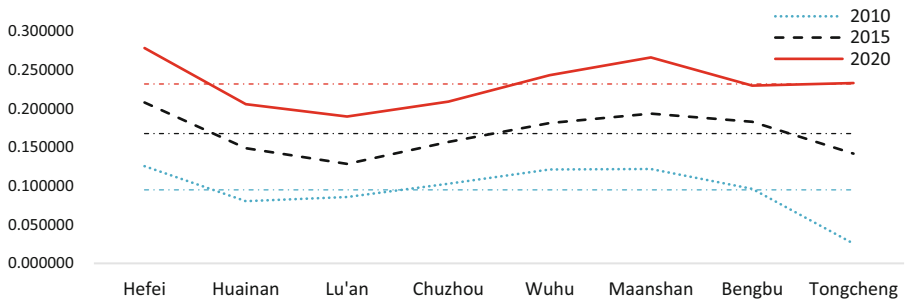


Fig. 5. Results of the evaluation of the physiological demand for habitat quality in the cities of the HeFei metropolitan circle of China

Security Requirements. From the results, we can see that the security demand level scores for urban habitat in the HeFei metropolitan circle of China are generally decreasing between 2010 and 2020, and the decrease is more obvious between 2010 and 2015.

In terms of ecological safety, the ecological quality of the city has improved to a certain extent in recent years, with the proportion of days with air quality reaching level 2 increasing significantly, and the ecological safety score is on the rise. As can be seen from the regional variance chart, the high level of urban habitat quality and safety demand scores in Lu'an is largely due to its mountainous location and good ecological environment, which makes urban ecological safety higher than that of other cities, as well as its relatively low population density, which reduces the probability of conflicts and makes social security relatively stable. Huainan has shown a more obvious downward trend in the last 10 years, due to the fact that Huainan, as a resource-based industrial city, is greatly affected by the depletion of resources and the environmental problems caused by industrial pollution. Hefei's rapid economic development and high population density has put greater pressure on ecological safety, while the economic attraction of migrant workers and the influx of a large number of migrant workers has also posed a significant threat to social security, resulting in a lower score on the safety dimension compared to other cities.

The other cities' overall scores are relatively flat, but on a declining trend. This calls for a combination of adherence to the rule of law and the rule of ethics in the subsequent development of the city, and the improvement of the quality of life of the residents, so that the social security of the city can be guaranteed, thus greatly improving the satisfaction of the city residents with the quality of their living environment (Fig. 6).

Social Needs. In the perspective of social interaction demand, the quality of urban habitat can be analysed in three aspects: cultural demand, social interaction and road traffic system.

From the results, we can see that the social demand scores of cities in the metropolitan area showed a rapid growth trend during the period 2010–2015, and a relatively slow growth during the period 2015–2020, with some cities showing a decreasing trend. As the capital city of the province, Hefei's rapid economic growth has attracted a large influx of foreigners into the city, triggering a massive gathering of people, accelerating interpersonal communication and promoting social interaction among city residents, so

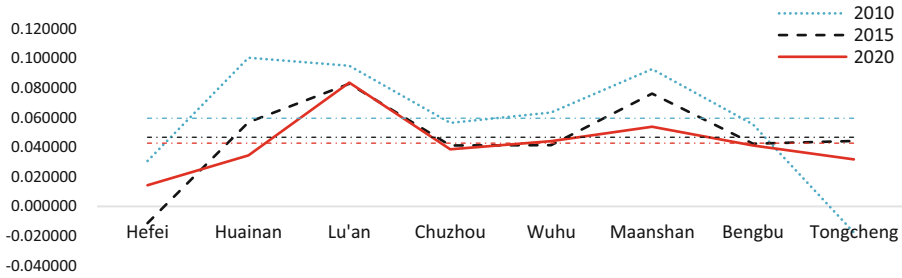


Fig. 6. Results of the evaluation of the demand for quality and safety of the human environment in the cities of the HeFei metropolitan circle of China

it ranked first in the metropolitan area in 2010. However, with the development of the metropolitan area, other cities are paying more and more attention to the development of social infrastructure and Hefei’s urban infrastructure development is struggling to keep up with the rate of population growth, so the advantage of Hefei’s scores is no longer obvious.

As can be seen from the figure, the social needs scores of cities in the eastern part of the metropolitan area have generally increased from low to high levels, while cities in the central and western parts of the metropolitan area have generally remained the same and are lagging behind, with significant differences in the development of social needs between the eastern and western parts. Hefei, Chuzhou, Ma’anshan and Tongcheng, which have seen rapid development of their socio-economic base over the last decade and a high degree of openness to the outside world, have also seen their social needs scores increase year on year and are above average. Huainan, as a resource-based city, is facing development challenges after the depletion of its resources, and its socio-economic development has been slow, showing a downward trend in the last five years, with solutions to be found. Bengbu and Liu’an, two cities that have experienced a significant population exodus in recent years, are experiencing slow economic development and have maintained their social interaction at the same level (Fig. 7).

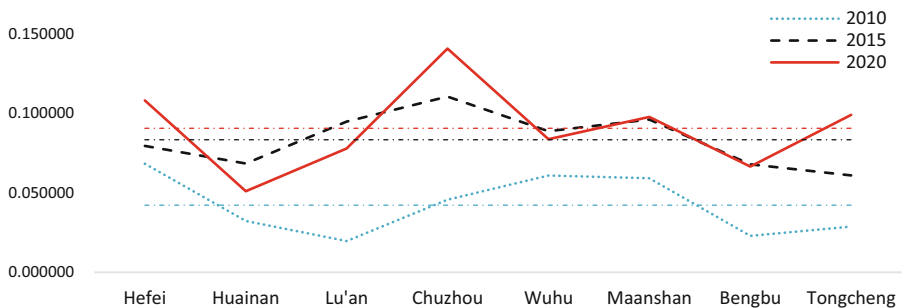


Fig. 7. Results of the evaluation of social demand for habitat quality in HeFei metropolitan circle of China cities

Self-fulfilment Needs. From the perspective of self-fulfilling demand, the metropolitan area clearly shows an upward trend during the period 2010–2020, and the growth rates are similar between the time periods 2010–2015 and 2015–2020. There are large differences between cities in 2010 and 2015, but as the development of the metropolitan area drives, the ability of each city to meet self-fulfilling demand in 2020, with the exception of Tongcheng, which is on the low side, the difference in capacity between the seven cities is not significant (Fig. 8).

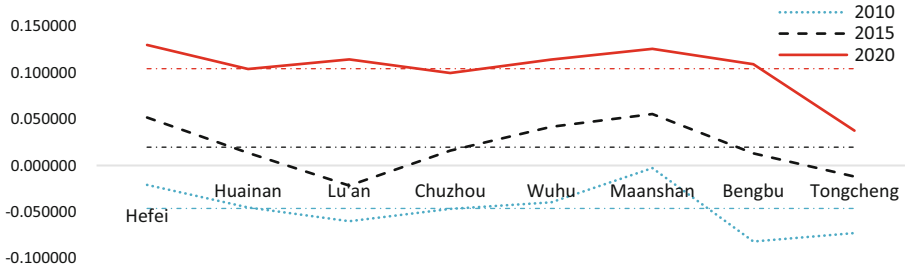


Fig. 8. Results of the self-fulfilling needs evaluation of the quality of the habitat in the HeFei metropolitan circle of China by city

From the regional divergence chart, we can see that Hefei, as the national centre of science and education, has rapid economic development, so the per capita wage is high and there are many employment opportunities, but the influx of a large number of foreign population, the urban registered unemployment rate also increased more than other cities, so although the capacity in 2020 is in the first place, but does not present an absolute advantage. The cities of Bengbu, Huainan and Maanshan have focused on for industrial development in recent years, introducing new industries and expanding the scale of industries, solving the problem of re-employment of the unemployed population and increasing per capita wages, thus driving the dimension score up from low and medium levels to higher and high levels. Chuzhou and Tongcheng, on the other hand, have more homogeneous industries, slow economic development and insufficient development opportunities for city residents, and are lagging behind in terms of urban development (Fig. 9).

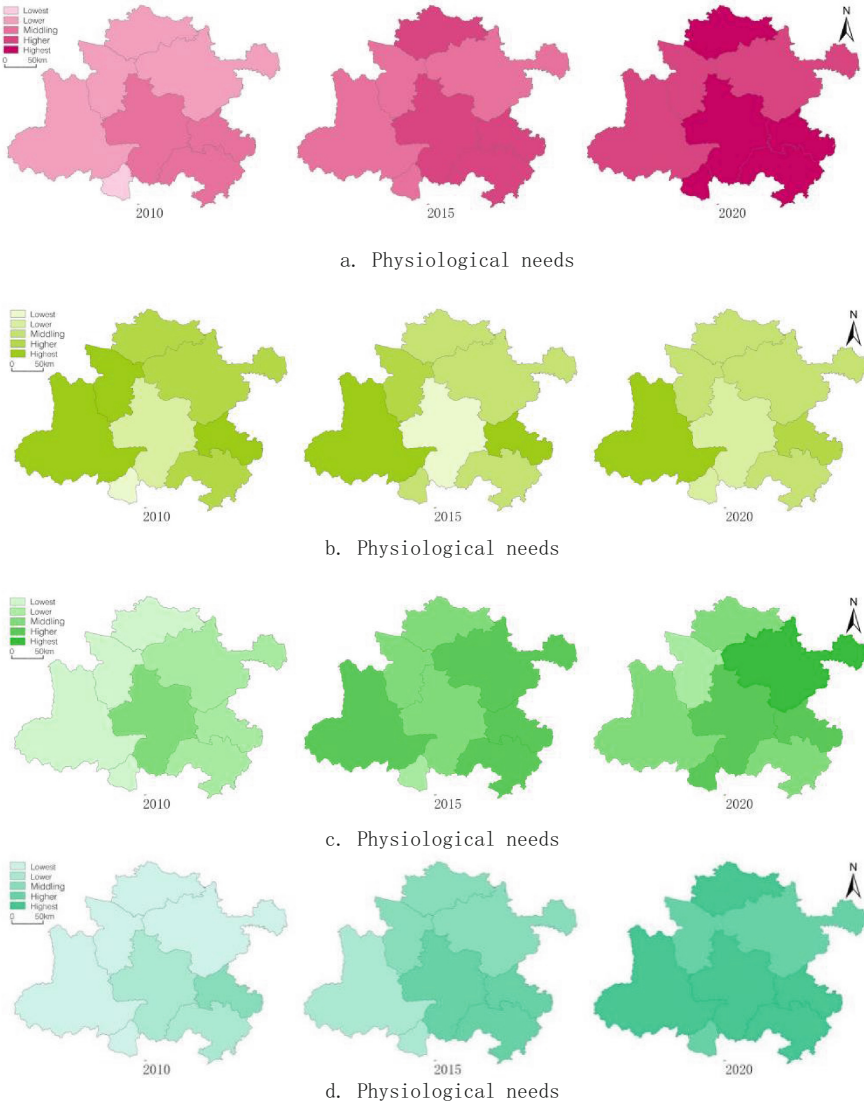


Fig. 9. Regional differences in the evaluation of the quality of the human habitat in the HeFei metropolitan circle of China by city

5 Conclusions and Recommendations

5.1 Conclusion

Based on theory of humanism, this paper constructs an evaluation system for the quality of human living environment in the HeFei metropolitan circle of China in 2010, 2015 and 2020 through AHP, and conducts an evaluation study on the quality of human living

environment in each city under different dimensions. It can be seen that the overall quality of human living environment in the HeFei metropolitan circle of China has shown an increasing trend in recent years, but with the rapid development of the city, there are still some dimensions showing different degrees of decline in different cities. The main research findings are as follows:

Differences in Hefei's urban habitat quality scores are mainly in the areas of social and safety needs, including social security, traffic safety, green space per capita, air quality, library collections and road space per capita, which are most strongly associated with urban habitat quality. In addition, livelihood security, basic medical care and infrastructure construction also have a significant impact on the quality of the living environment. These factors contribute to the uneven development of cities in the HeFei metropolitan circle of China, which are important influencing factors in the development of the urban living environment.

From the results of the evaluation, we can see that the level of economic development largely affects the quality of the habitat environment. Cities with a weak socio-economic base have an obvious deficiency in the quality of their habitat environment compared to economically developed cities, reflecting that the basis for improving the quality of the habitat environment is to promote the economic development of the city.

As can be seen from the figure, cities close to the Yangtze River Delta city cluster, Jiangsu and Zhejiang, which are experiencing rapid economic development, are to a certain extent advantaged by their radiation to the surrounding cities, while cities in the west near the Dabie Mountain belt are underdeveloped in terms of habitat quality.

5.2 Recommendations

Enhancing the Economic Development of the City. An important measure to improve the quality of the urban habitat is to improve the overall economic level of the cities in the HeFei metropolitan circle of China. The cities in the western part of the metropolitan area are slow in economic development and have relatively low scores in terms of the quality of their living environment. By promoting the construction of various infrastructures, strengthening the economic ties between the cities and those with higher levels of economic development in HeFei and the eastern part of the city, and appropriately implanting new industries based on the sustainable development of the city, the city's development potential can be stimulated and the comprehensive economic level of the cities in the HeFei metropolitan circle of China can be improved.

Strengthening Ecological Civilization. In the above study, it can be seen that urban ecological civilization is an important indicator in the evaluation of the quality of human living environment. To strengthen the construction of ecological civilization control mechanisms for cities, from the perspective of sustainable urban development, attention should be paid to carbon emissions, green space system planning and other aspects to increase the area of green space per capita. In addition, for resource-based and industrial cities, it is necessary to accelerate the economic transformation of cities, scientifically co-ordinate resource development patterns and introduce green technologies, while conducting urban vulnerability analysis, establishing ecological civilization control systems and strengthening supervision and management. By strengthening the urban ecological environment, the quality of the urban habitat can be improved.

Strengthening Regional Integrated Planning. Research has found that economically developed big cities have economic, population and resource agglomeration effects, and have a strong radiation-driving ability for the surrounding cities, and the quality of the living environment of the surrounding cities will also be affected and improved to a certain extent. Therefore, it is important to strengthen regional planning at the top level, pay attention to the co-ordination between the city and the surrounding economically developed areas, stimulate the radiation-driving effect of the big cities on the surrounding cities, and drive the economic and cultural development of the city with the economic, cultural and talent resources of the big cities, so as to promote the improvement of the quality of urban living environment.

Acknowledgement. The work was supported in part by Anhui Provincial Housing and Urban-Rural Development Department Project (2020-RK04) and research on Urban and Rural Convenience Planning”, Anhui Jianzhu University (HXS2019004).

References

1. Xiong, Y.: Uncertainty evaluation of the coordinated development of urban human settlement environment and economy in Changsha city. *J. Geog. Sci.* **21**, 1123–1137 (2011)
2. Wang, Yt.: Exploration on the application of urban habitat quality evaluation index system–based on the practice of urban physical examination pilot. *Western J. Habitat Environ.* **36**(06), 50–56 (2021)
3. Chen, J.: Temporal-spatial assessment of the vulnerability of human settlements in urban agglomerations in China. *Environ. Sci. Pollut. Res.* 1–17 (2022)
4. Xu, H.: A comprehensive and systematic evaluation of China’s urban habitat construction through urban physical assessment system. *Shanghai Urban Plan.* **01**, 47–51 (2022)
5. Wang, Jg.: Overview: new trends and insights in urban habitat creation. *J. Architect.* **04**, 1–3 (2018)
6. Guan, Yy.: Comprehensive suitability evaluation of urban habitat in Liaoning Province based on geographically weighted regression model. *Geoscience* **42**(12), 2097–2108 (2022)
7. Wang, L.: Current situation and trend analysis of habitat research based on knowledge mapping. *Green Technol.* **24**(14), 164–169 (2022)
8. Cui, S.: A study on the spatial and temporal variation of urban habitat quality in Hubei Province based on entropy weight TOPSIS. *J. Huazhong Normal Univ. (Nat. Sci. Ed.)* **56**(04), 695–702+716 (2022)
9. Li, S.: Evaluation of urban habitat quality in Ningxia based on hierarchical analysis and entropy power method. *J. Appl. Ecol.* **25**(09), 2700–2708 (2014)
10. Dong, Z.: Comprehensive evaluation of habitat quality of Shandong Peninsula urban cluster. *China Popul.-Resour. Environ.* **27**(03), 155–162 (2017)
11. Xu, Xm.: Urban planning and community construction based on humanistic theory. *Housing Real Estate* **12**, 258+277 (2020)
12. Maslow, A.H.: A theory of human motivation. *Psychol. Rev.* **50**(4), 370 (1943)
13. Maslow, A.H.: *Motivation and Personality*. People’s University of China Press, Beijing (2007)
14. Li, Xw.: Factors influencing rural habitat environment based on Maslow’s Hierarchy of Needs theory - a green development perspective of urban and rural construction. *J. Hebei Agric. Univ. (Soc. Sci. Ed.)* **24**(04), 30–37 (2022)

15. Bao, J.: From survival to self-actualization: urban habitat quality evaluation from the perspective of hierarchy of needs theory—an example from Anhui Province. *Urban Dev. Res.* **27**(09), 88–95+140 (2020)
16. Chen, Cy.: Assessment of urban habitat quality and influencing factors in the Bohai Sea Rim. *Adv. Geogr. Sci.* **36**(12), 1562–1570 (2017)
17. Zhu, B.: Evaluation of rural habitat quality and spatial pattern analysis in Jiangsu Province. *Econ. Geogr.* **35**(03), 138–144 (2015)
18. Hefei Metropolitan Circle of China. https://baike.baidu.com/item/%E5%90%88%E8%82%A5%E9%83%BD%E5%B8%82%E5%9C%88?fromModule=lemma_search-box. Accessed 15 Mar 2023
19. Sun, Hb.: Evaluation of rural habitat environment quality and differentiated management strategies in China. *J. Xi'an Jiaotong Univ. (Soc. Sci. Ed.)* **39**(05), 105–113 (2019)