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Discussion on the visual influence of cultural architectural heritage

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Abstract: China has a long history and culture, with many historical sites, cultural protection areas, historical blocks and other urban heritage protection areas. The surrounding environment may bring adverse factors to the protection of cultural heritage. This paper reviews some methods and thoughts on the evaluation of visual influence factors at home and abroad. From the outstanding universal value to the connotation and evaluation of visual integrity, this paper analyzes the research cases, in order to provide some help for the protection of cultural heritage in China.

Keywords: Cultural heritage; Visual impact; Heritage environment.

1. Introduction

The United Nations pays more and more attention to the protection of heritage, clarifies some principles of cultural heritage protection, puts forward the concept of outstanding universal value of heritage (OUV), and calls for the protection of the integrity of cultural heritage. Visual impact generally refers to the impact of intervening in the environment, destroying or changing the harmonious, stable, beautiful and visually complete and continuous adverse entities of the landscape. Sun Yan proposed that the aesthetic and historical value of urban economic benefits and cultural heritage should be reasonably balanced. In addition to limiting the height of elevation buildings in the buffer zone, he also discussed the different tolerance of different heritages to the environment through several case studies. Not only should the shape, height and color of the elevation buildings in the buffer zone be controlled, but also some buildings outside the buffer zone should be given certain attention [1]. Xiao Hong did not discuss from environmental impact assessment to heritage impact assessment to heritage environmental impact assessment, and pointed out that heritage environmental impact assessment is an assessment of the impact of development or construction projects on the historical environment (including natural environment, artificial environment, human environment, etc.) associated with the heritage to take identification, assessment, mitigation measures and other series of processes [2]. There are a large number of historical heritages in China, so it is necessary to evaluate the visual impact correctly and reasonably in order to protect them better.

2. Cultural heritage

(1) Value connotation

In the vast river of human history, those resplendent cultural remains are what we call cultural heritages. They are not only the crystallization of human wisdom and creativity but also precious treasures that have been passed down through generations and preserved to this day. According to the detailed interpretation of UNESCO, the broad category of cultural heritage is subdivided into two main branches: tangible cultural heritage and intangible cultural heritage. They are like twins, jointly weaving a colorful picture of the diversity of human civilization. Intangible cultural heritages mainly include some skills that need to be passed on. For example, Peking Opera, Yu Opera, Huangmei Opera, Qinqiang Opera, Khoomei, the craftsmanship of making Chinese xuan paper, etc. As for tangible cultural heritages, they include immovable cultural relics such as the majestic Great Wall of China, movable cultural relics such as the simple and solemn Houmuwu Tripod, the extensive and profound documents in the Library Cave of the Mogao Grottoes in Dunhuang, as well as historical building complexes, such as the traditional Naxi settlements in the Old Town of Lijiang, the romantic Water City of Venice, etc. Among them, architectural heritages are an important part of cultural heritages, such as the Iron Pagoda in Kaifeng, Zhenjue Temple, the Palace Museum (Fig.1), etc.

Fig.1 Architectural heritage

The protection scope of these architectural heritages includes the main body and the historical environment. The value of an architectural cultural heritage is reflected in the following aspects [3]:

Historical value: Cultural heritage is the product of history and the material and spiritual wealth left by the ancients to future generations. The historical value with time as the element is the inherent attribute of architectural heritage,

which objectively records a certain historical event or reflects the social style of a certain period. A concept closely related to historical value is the value of the times, which mainly refers to the traces of the years from the architectural heritage. It is a value derived from the passage of time and is essentially an aesthetic emotional value.

Aesthetic value: Traditional embroidery patterns often have strong freehand brushwork characteristics. For designers, they do not pursue the perfect proportion too much, but pay more attention to the meaning of the pattern itself and the emotional effect brought by the pattern. Traditional embroidery patterns have a very strong freehand effect. In particular, part of the pattern only through some simple lines, to draw the content, can be very vivid expression of the original features. In the development of embroidery art, designers need to grasp the characteristic expression of freehand brushwork, recognize the inherent laws of things, and then show the profound connotation of embroidery art.

Science value: The so-called scientific value mainly refers to the scientific and technological information contained in the architectural heritage. The architectural heritage of different eras represents and embodies the technical concept, construction method, structural technology, building materials and construction technology of that era to a certain extent, and then reflects the level of productivity at that time. It has become a material witness for people to understand and understand the history of architectural science and technology, which is of great significance to scientific research.

Cultural and educational value: As a ' silent ' educator, the cultural and educational value of the cultural and architectural heritage provides people with the value elements of cultural pride, social enlightenment value, cultural symbol and cultural narrative.

Economic value: The economic value of architectural heritage is essentially a derivative value. It is not its own inherent non-dependent value. Only when the heritage has cultural value can its economic value be derived.

(2) Outstanding universal value

A concept proposed by UNESCO, included in the ' World Heritage Convention ' for the protection of heritage. The so-called value is given by people, and the outstanding universal value is also a kind of value. It is not inherent in the heritage. People give land and realize the value of land. The meaning of “universal” of “outstanding universal value” is to establish the universal values of human beings through world heritage projects, so that people of different countries and nations can abide by the rules of behavior and establish the value system advocated by UNESCO. The simple universal value is unequal and prominent, and an explanation of the prominent is excellent, unique and distinctive. It mainly refers to the rare and impressive prominent features that can be left to all mankind to benefit people. The outstanding universal value is used to construct the value system universally recognized by human beings, and to promote world peace and unity. Unity and difference are the basis and significance of its existence. It is necessary to extract the universally recognized value of human beings from the world heritage, and to ensure the individuality and independence of each culture [4].

(3) Visual integrity

With the continuous refinement of the world heritage assessment methods, the concept of visual integrity has been applied to describe the visual continuity and integrity of a certain heritage. The definition of the integrity of cultural heritage in the Operational Guidelines was formed during the revision in 2005. Integrity is defined as “a measure of the integrity and soundness of natural and/or cultural heritage and its carriers. To examine the integrity status, it is necessary to assess whether the heritage: 1) contains all the elements required to express its Outstanding Universal Value (OUV); 2) has a sufficient scale to ensure the overall representation of the characteristics and processes expressing its significance; 3) has suffered negative impacts brought about by development and/or decline.” Article 89 further explains the integrity of cultural heritage: “The physical texture of the heritage and/or its characteristics should be well-preserved, and the impact of the decline process should be controlled. All the important elements required to express its overall value should be included. For cultural landscapes, historic towns or other living heritages, the relationships and dynamic functions that are essential to their unique characteristics should also be preserved.” Although the concept of visual integrity is not explicitly used here, the definition emphasizes that for living heritages, the “relationships” and “functions” that contribute to the characteristics of the heritage are also important aspects of integrity. The term "relationship" here may imply a certain visual connection [1].

3. Visual impact assessment

(1) Concept

Generally speaking, visual impact refers to the factors that weaken or destroy visual integrity and bring about unfavorable visual effects. It can be explained as follows: In a previously relatively harmonious perceptual environment, the introduction of an entity with a negative style makes the visual landscape quality perceived by the observer decline. This includes the incoordination of color, texture, and volume, as well as the obstruction of the field of vision, etc., which is called visual impact [5]. The evaluation methods of visual impact roughly include the following:

Research methods based on the theories of landscape sensitivity and landscape threshold. Landscape sensitivity is a comprehensive reflection of the degree to which a landscape is noticed, etc. It is closely related to factors such as the lines, colors, and shapes of the landscape itself, and the degree of its being affected is positively correlated with landscape sensitivity. The factors influencing the landscape threshold are divided into internal factors and external environmental factors. In terms of internal factors, vegetation is the most direct factor affecting the landscape threshold. Additionally, external factors such as climate and adjacent landscapes also have a non-negligible impact on the landscape threshold.

Fractal theory. The original meaning of fractal is fragmentation and irregularity. The essential characteristic of a fractal is self-similarity or non-scaling property. Fractal beauty refers to the pleasure that fractal art provides in terms of people's perception and cognition, that is, the beauty of fractal art. This research is of great significance for the study of landscape aesthetics. The fractal dimension is a parameter used to quantitatively characterize a fractal, and it is the main tool for studying fractals.

Landscape control method. Many countries have successively introduced various policies and regulations for the study and protection of landscapes. Although each country has its own focus, they basically conduct height control through observation by the method of looking out. This method has good reference significance for landscape protection assessment and the improvement of landscape

quality.

Evaluation methods combined with computer technologies such as visualization. By utilizing computer technologies such as GIS (Geographic Information System) spatial analysis, 3D models, and visualization, it is possible to more intuitively observe and predict the impacts brought about by landscape changes, and it is also easier to obtain relevant data. GIS spatial analysis can quickly and effectively analyze large-scale regional data, and 3D models can simulate and predict multiple planning schemes, so as to formulate measures to reduce the landscape impact by analyzing each scheme.

(2) Research status

At present, there are many methods for evaluating visual impacts. For example, Niu Xinyi et al. improved the SOI index (Spatial Openness Index) by combining it with the D/H index. They divided the visual experience of spatial openness into two-dimensional visual impact and three-dimensional visual impact, and proposed evaluation indicators such as the line-of-sight rate and the average visual occlusion distance [6]. Based on obtaining the favorable positions of buildings, Lopes, A.S. et al. analyzed the composition of heritage landscape elements and the environment through the construction of visual cones, and proposed an algorithm for the impact of the environment on heritage landscapes [7]. Peng Jiandong et al. explored the visual impact factors of the urban spatial environment, and conducted an evaluation and analysis of Xiangyang Ancient City from three aspects: the degree of line-of-sight in urban space, the urban contour morphology, and the urban spatial hierarchy [8]. Xiao Hongwei et al. evaluated a development and construction project around the Man Mo Temple in Hong Kong, mainly explaining the visual impact of the project on the Man Mo Temple, the mitigation measures, and the evaluation grade [9]. Xu Huan et al. used remote sensing (RS) and geographic information system (GIS) technologies to conduct a systematic landscape classification study of the environment around the Grand Canal. By calculating the visual impact degree of the landscape, the research team further applied the chromatic positive overlay method to analyze the sensitivity levels of different regions. This research provides an important scientific basis for understanding the landscape characteristics and their visual impacts of the environment around the Grand Canal, and contributes to environmental protection and sustainable development [10]. Janjira Sukwai et al. studied the Doi Suthep Mountain and the historic old city area of Chiang Mai. They selected the main east-west roads in the old city area, took the Visible Mountain Areas as the benchmark, and used the statistical correlation method to analyze the relationship between them and the Visible Building Areas, and determined the visual sensitive areas of five regions [11].Seyedashrafi B collected data through investigations, calculated the impact assessment matrix, and formulated an impact assessment procedure applicable to the Masjed-e Jame heritage in Isfahan to reduce the negative impacts on the property [12]. Widodo, J envisioned that the proposed digital platform of the HUL would become a tool for comprehensively evaluating the value of specific buildings or sites to the urban heritage of Singapore. It affects the shape of protection strategies and urban planning, and digitally restores cultural heritage, and conveys the awareness of heritage protection on the digital platform [13].

4. Conclusion

As an ancient civilization with a long history, China is home to a vast array of cultural relics, traditional architectures, and historical sites that are extensively distributed across its territory. During the long process of historical evolution, certain regions, enriched with a significant number of cultural and historical heritages, have gradually developed diverse cultural spatial forms, such as ancient cultural cities, historical blocks, scenic tourist areas, and cultural relic protection zones. These areas, bearing profound historical memories and cultural values, not only serve as material testimonies of the development of Chinese civilization but also act as crucial carriers for maintaining national cultural identity.

As a crucial component of the cultural heritage system, cultural architectural heritages exhibit distinct regional characteristics and rich cultural connotations throughout the historical development. Influenced by multiple factors such as the natural environment, social economy, and historical context, cultural architectural heritages in different regions have given rise to diverse physical spatial forms and intangible cultural traditions. For example, the Forbidden City in Beijing, as a complex of imperial palaces from the Ming and Qing dynasties, its architectural regulations, spatial layout, and decorative art profoundly reflect the hierarchical system and cultural concepts of the feudal dynasties. The Fujian Tulou, on the other hand, embodies the survival wisdom and clan culture of the Hakka people who lived in communal dwellings. From a historical perspective, the evolution of architectural styles in each period is clearly discernible: Tang - dynasty architectures are renowned for their grandeur and simplicity in structure; Song - dynasty architectures tend to be delicate and elegant, with an emphasis on detail - oriented construction; while Ming and Qing architectures are characterized by strict regulations and magnificent decorations.

Furthermore, due to significant differences in geographical location, climate, and ecological environment, the environmental adaptability and carrying capacity of different heritages vary considerably. For instance, the heritage sites in the northwestern region are vulnerable to wind - sand erosion and arid climates, whereas the wooden structures in southern regions face issues such as decay and insect infestation caused by humid conditions. Therefore, in the practice of cultural heritage protection, it is essential to fully consider the diversity of regional characteristics and environmental conditions, systematically draw on mature protection experiences both at home and abroad, and formulate protection strategies that are tailored to the unique characteristics of heritages and the requirements of their surrounding environments through scientific analysis and rational judgment.

Based on the theoretical and practical needs of cultural heritage protection, this paper systematically expounds on the connotation, value system of cultural heritages, and the significance of their protection. From a theoretical perspective, it deeply analyzes the generation mechanisms and influencing factors of visual impacts, conducts empirical research by combining typical cases at home and abroad, and summarizes the practical experiences and innovative methods in the protection of different types of cultural heritages. The purpose of this research is to provide references for theoretical research and practical exploration in the field of cultural heritage protection, and to promote the improvement of the theoretical system of cultural heritage protection and the innovation of protection technologies.

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