From Green to Healthy, Analysis of Humanistic Strategy under Ecological City Space

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Abstract. In recent years, the global ecological environment has further deteriorated. After frequent pollution and public health incidents, we all have higher expectations for the cities in which we live. With the vigorous promotion of green ecological urban areas in China, the country is paying more and more attention to the construction of people's cities such as ecological environment and healthy cities. This paper constructs a new generation of people-oriented ecological city through three spatial levels of "green and healthy building cells–green and healthy community units–green and healthy urban areas". Based on the analysis of standards and objectives under different spatial levels of the city, this paper puts forward corresponding human-oriented objectives strategies such as safety, health and wisdom under the concept of "green and healthy", pays attention to people's green livability, health and safety in urban areas, communities and architectural spaces, and provides support for the development of the city in the future.

1. Introduction
The 19th National Congress of the Communist Party of China pointed out that in order to speed up the reform of the ecological civilization system and build a beautiful China[1], all provinces and cities across the country have issued relevant policies to promote the construction of green ecological urban areas. The large-scale development of green ecological urban areas has become an important starting point for the new round of urban construction of livable cities and ecological cities, as well as an important way of high-quality construction. In December 2015, General Secretary Xi Jinping stressed at the Central City Work Conference: For doing a good job in urban work, we must conform to the new situation of urban work and the new expectations of the people. Adhering to the core requirement that people's city is for people, focusing on the development process of green ecological urban areas in recent years, policy guidance and the new round of overall planning objectives[2-5], urban construction has gradually changed from a function-oriented to a people-oriented and demand-oriented. Especially in the face of the increasingly deteriorating ecological environment in the world in recent years, and the frequent urban pollution, sudden public health incidents and other impacts[6-7], health has become the most important measurement standard under the guidance of people-oriented needs. Under this background, this paper puts forward green and healthy planning strategies under different scales and spatial levels through literature research on relevant standards and theories, and defines the construction objectives of a new generation of ecological cities.
2. Analysis Path of Green and Healthy Planning Strategy

In 1996, the World Health Organization (WHO) published "Ten Standards for Healthy Cities"[8]. It is proposed that a healthy city should be composed of a group of healthy people, a healthy environment and a healthy society. This is in line with the concept of "resource conservation and environmental friendliness" in China's green ecological urban areas[9]. The beneficiary groups are all members living in the city, including adults, children, the elderly, etc. The impact on the environment is at all kinds of spaces and corresponding facilities in the city. At present, there are relatively few public spaces for the elderly, children and other for activities in the city, and there is a lack of safe, community environment suitable for communication, walking and riding, and opportunities to get close to nature[10]. According to the survey, 11% of the productivity growth is due to the fresh air in the city. When you have good lighting and vision, the work efficiency will be increased by 18%, and every 1% reduction in health risks will save thousands of yuan of medical expenses per person per year[11].

Therefore, this paper proposes to form a people-oriented city with three levels of spatial organization: "green and healthy building cells–green and healthy community units–green and healthy urban areas"(Figure.1). Focusing on the green and healthy strategy under various groups and people-oriented goals in the green ecological city planning, and based on the three important spatial scales of eco-city construction, this paper analyses the differences and commonness between green goals and health goals under different spatial scales, explores the sustainable development of the city based on humanism, and pays attention to the green, livable, healthy and safe people in urban areas, communities and architectural spaces.

![Figure 1 Composition of human-oriented urban spatial organization](image)

3. Green and Health Strategy at Urban Level

From an urban perspective, at present, the health of personnel is mainly related to living environment, social environment and physical health. The existing Green Eco-city Evaluation Standard (2018) focuses on showing the green and healthy of a city's space, facilities and environment from the perspective of green planning, construction, operation and maintenance, while the National Healthy City Evaluation Index System (2018) [12] pays more attention to the personalized needs, mental health, medical and health services of different groups in addition to healthy environment and social health (Figure. 2). According to the characteristics of the two standards, the next generation of urban areas will pay more attention to people-oriented needs, integrate green and healthy developments, attach importance to the safety, health and intelligent realization technologies of the population, and put forward the following response strategies.
Figure. 2 Analysis of Urban Standards Based on Green and healthy Goals

3.1. Strategies for security
According to the city's dominant wind direction, construct ventilation corridors, plan the city roads to be consistent with the dominant wind direction, enhance the city's air circulation capacity, alleviate the city's heat island, improve human comfort, improve the local climate environment, and protect people from health emergencies; Through the provision of diversified housing to build an equal mechanism, regularly carry out social public sentiment surveys to tap the needs, perceive the needs of multi-structure groups, and improve the sense of belonging and happiness of urban residents.

3.2. Strategies for health
Build greenways that meet the needs of citizens for leisure, slow walking, fitness running and barrier-free slopes, to form a slow walking fitness trail system, to improve the comfort, accessibility and feedback of walking space, to enhance the awareness of national fitness, and to attract healthy sports; By creating urban activity centers, block parks and other activity spaces, provide daily activity places such as communication, recreation and exercise to create public open activity spaces for improving the quality of urban life and forming a safe, friendly and comfortable living environment; Set up mixed-function neighborhoods with pleasant walking standards to provide food markets, banks, hospitals, schools and other functions, strengthen contacts between different classes, and create a vibrant city form.

3.3. Strategies for intelligence
Combined with physical infrastructure such as energy facilities and power facilities and digital infrastructure such as various urban sensors, Internet of Things and big data, urban intelligent infrastructure will be built to sense the city's operating status and population health in digital form. Taking users as the center, set up a "one Netcom office" government service full coverage network, implement online handling of government service matters, and promote enterprises to log in to the whole Netcom office only once, making everything easy to handle.

4. Green and Healthy Strategy At Community Level
From the perspective of community space, it has been 24 years since the publication of the first edition of Planning and Design Standard for Urban Residential Areas (2018) [13] in 1994. The new edition of the standard takes "people-oriented, green development, full-age friendliness" and other ideas as its
concepts, establishes the concept of living circle, and constructs a 5-minute/10-minute/15-minute living circle to meet the needs of service facilities at all levels. From the perspective of facilities and travel, the convenience of living and residing is effectively considered, and at the same time, the quality of community environment including air, water and living comfort is also taken into account. However, the community specified in the Healthy Community Evaluation Standard released in 2020 is a standard provider based on the satisfaction of the basic functions of the community, providing people with healthier environment, facilities and services to promote people's physical and mental health and realize the improvement of health performance (Figure. 3). Both standards consider green and healthy community construction from different angles. The former focuses more on space and facilities construction, while the latter pays more attention to physical and mental health. According to the characteristics of the two standards, based on people's feelings and perceptions, the following response strategies are proposed.

**Community**

**Air**
- Reasonable layout of facilties easy to produce odor
- Low-impact development
- Reasoning and utilization of existing water bodies

**Water**
- Noise, corresponding reasons to reduce noise and light pollution
- Sunlight, green space, water, sunshine requirements
- Provide right lighting and no light pollution; generate, etc.

**Comfort**
- Activity spaces: facilities, places and games for the elderly, children and the disabled
- Community service station: cultural activity station
- 90% of the community parking location
- Funeral facilities, comprehensive fitness venues, service stations, garbage collection points, community centers, etc.

**Fitness**
- Community service station: cultural activity station
- 90% of the community parking location
- Funeral facilities, comprehensive fitness venues, service stations, garbage collection points, community centers, etc.

**Human culture**
- Communication: communication venues to meet needs of different groups: free community public space
- Psychological: mental health support
- Full-age friendly: free barrier design

**Service**
- Management: healthy community management system; health service facilities; environment monitoring information system
- Food: sufficient food supply
- Activity nutrition education activities; free public benefit activities

**4.1. Strategies for security**

Through safe and comfortable street furniture, an area for pedestrians to rest is provided to avoid walking for too long, and at the same time, street furniture can play a role in isolating streets and walkways; Design vivid and interesting signs in combination with venues, places and functional areas to enhance the vitality and perception of the community and create an interesting and upward positive atmosphere on the premise of ensuring community safety guidelines. Create a safe and participatory greening landscape, and increase the opportunities to play, walk freely and participate in nature. The combination of community street greening and landscape can increase the affinity of streets.

**4.2. Strategies for health**

To build a healthy outdoor direct drinking water system. Direct drinking water is richer in mineral elements and can provide more elements needed by human body than ordinary drinking water. Outdoor, convenient and clean direct drinking water is very beneficial to human health and can be combined with public spaces, parks, streets and other settings. Add space for different ages. Space for different ages can make children and the elderly benefit from each other. The knowledge of the elderly can be passed on to children. Playing with children can make the elderly no longer lonely. Space for activities for different ages can make people of different ages communicate and play together to enhance family cohesion and community ties. Set up low-risk space for children to play and provide...
play facilities. At the same time, attention should also be paid to the types of play of children of different genders and ages. Set up full-age construction space, design rich and healthy sports venues in series with natural landscape, and create a convenient and safe full-age friendly fitness space.

5. Green and Health Strategies at Building Level

Research shows that more than 87% of one’s life is inside buildings. The environment of building is related to human health and life quality. Assessment standard for green building (2019) [14] mainly proposed requirements for buildings from safety and durability, health and comfort, occupant convenience, resource saving and environment livability. Assessment standard for healthy building (2016) [15] established index system with six health elements of “air, water, comfort, exercise, humanity and service, in order to provide healthier environment, facilities and services for building users on the basis of meeting building functions. These two standards consider green and healthy building construction from different ways, the former is more concerned with the construction of the building itself, while the latter is more concerned with the physical and mental health of living in the building. Considering the different perspectives of green health, according to the characteristics of two standards, green and healthy buildings in the future will enhance the health performance of building space, facilities, equipment and services from the perspective of users (Figure.4), the strategies are as follows:

![Building Standards](attachment:image)

**Figure. 4** Analysis of building standards based on green and healthy goals

5.1. Strategies for security

The construction site should avoid the dangerous section, and the infrastructure should be set according to the geological conditions; environmental-friendly building materials with corrosion preventive, good durability are adopted; ensure safe and healthy indoor environment through advanced air conditioning and building system design and regular air conditioning cleaning during operation and maintenance; set up outdoor communication area and barrier free elevator to ensure the safety of public activity space; maintain hot water system and direct drinking water system, clean water storage facilities regularly, monitor water quality online, and ensure drinking water safety; set up a warning sign system with safety protection inside the building.
5.2. Strategies for health

Improve the sound insulation performance of components, to create a quiet and comfortable soundscape; create a comfortable and adjustable thermal environment to meet personalized needs from air temperature, humidity, air flow rate and other aspects; through lighting design and intelligent lighting control, the lighting spectrum and intensity can be adjusted according to time and demand to create a healthy, comfortable and efficient light environment; provide activities venues for children and the elderly, indoor and outdoor fitness equipment, first-aid kit and other supporting products to provide diverse choice of places and emergency protection for residents' activities; provide ergonomic lifting station, adjustable screen, etc. to reduce body damage.

6. Conclusion

In recent years, the global ecological environment has further deteriorated. Frequent pollution incidents and public health incidents make us all have higher expectations for the cities where we live, including environmental green, urban health, full-age friendly design, intelligent and convenient services. With the vigorous promotion of green ecological city in our country, the state is paying more and more attention to the construction of people's cities such as ecological environment and healthy cities. Therefore, the new generation of cities proposed in this paper should take "people-oriented" as the core value and "green health" as the guidance. It is composed of three levels of space: "green and healthy building cell--green and healthy community unit--green and healthy urban area". Through the analysis of standards and objectives at different spatial levels, this paper puts forward corresponding human-oriented objectives strategies such as safety, health and wisdom under the concept of "green and healthy", pays attention to the green and healthy needs of residents of all ages living in the city in physical, mental and material space, and provides support for the development of the city in the future.

References

[1] Summer. On the Construction of Legal Guarantee System for Ecological Civilization Construction [J]. Legal Expo, 2018, 000 (014): P.16-18.
[2] Li Bing, Li Xun. Current Situation and Trend of Green Ecological City Development [J]. Urban Development Research, 2016.
[3] Pan Hongyan, Han Jihong, Sun Hua. Prospect of Green Eco-City under the Background of Shanghai 2035 General Rules [J]. Construction Science and Technology, 2018, 000 (008): 31-33, 37.
[4] Wang Fei, Shi Xiaodong, Zheng Hao, et al. Answer a Core Question and Grasp Ten Relationships–Exploration of Transformation in Beijing Master Plan (2016-2035) [J]. Urban Planning, 2017, 041 (011): 9-16.
[5] Hao Jie. Xiongan New Area: Building a Future City in a New Era [J]. Chinese Economic Information, 2019 (2).
[6] Cheng G , Wang M , Chen Y , et al. Source apportionment of water pollutants in the upstream of Yangtze River using APCS–MLR[J]. Environmental Geochemistry and Health, 2020(5).
[7] Bera B , Bhattacharjee S , Sengupta N , et al. Significant impacts of COVID-19 lockdown on urban air pollution in Kolkata (India) and amelioration of environmental health[J]. Environment Development and Sustainability, 2020, 22(6):1-28.
[8] World Health Organization. Regional Office for Europe. WHO Healthy Cities Project phase III: 1998-2002 : the requirements and the designation process for WHO project cities[J]. Saúde Da Populao Urbana, 1997.
[9] Evaluation Standard for Green Eco-urban Areas GB/T 51255-2017
[10] Huang Pengfei, HE Qian. Research on suitable community public space for urban elderly and children [J]. China Real Estate Industry, 2018, 000 (030): 65
[11] http://www.powerhouserowers.com DTZ Research
[12] Xiao (Wang Le), Li Qian. Evaluation Index System of National Healthy Cities (2018 Edition) was published [J]. China Health Pictorial, 2018, 000 (005): 48-49.
[13] Standard for Planning and Design of Urban Residential Areas GB50180-2018
[14] Green Building Evaluation Standard GB/T50378-2019
[15] Standard for Evaluation of Healthy Buildings T/ASC02-2016