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Research Paper

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Abstract

Under the development framework of the "New Urban Agenda", UNICEF provides a unified toolkit for the implementation of the "Child-Friendly City Initiative" in various countries, and provides guidelines for spatial and environmental development of child-friendly cities. In light of the differences in each country and city in the spatial planning and development of (a specific) child-friendly city, localization and translation need to be made to the general framework and basic principles. However, most previous studies on child-friendly urban space focused on the design of public spaces, but few on localized spatial planning of child-friendly cities. Taking Wuhan as a case, the present study attempts to localize the spatial planning strategy and implementation path of child-friendly city under the framework of the "New Urban Agenda". First, the study proposes an overall strategic framework guided by top design, supported by "social environment", and carried by "spatial environment". Drawing on practical experiences from various sources, the study proposes a three-level spatial planning system of "city - sub-district - community" to build a child-friendly city with Chinese local characteristics. Aiming at the four typical children's activity spaces, and taking into account the local features of Wuhan, the study further proposes the strategy for spatial improvement and standards for construction in line with local conditions, in an effort to materialize the idea of child-friendly city into specific actions of spatial development. Finally, based on current research findings, the study reviews Wuhan's approach to building a child-friendly city from a practical perspective, and puts forward suggestions for other cities in similar practices.

Keywords

Child-friendly City, Spatial planning, UN-Habitat, UNICEF, New Urban Agenda

1. Global exploration of child-friendly urban space under the New Urban Agenda

1.1. Laying a solid foundation: The United Nations Sustainable Development Goals (SDGs) and the "New Urban Agenda"

The 2030 Agenda for Sustainable Development, adopted by countries around the world in 2015, aims to eradicate poverty, protect the planet, and ensure prosperity for all. This guiding document includes 17 sustainable development goals, 10 of which are closely related to the well-being of children. In 2016, the "Habitat III" conference officially adopted a landmark document, the "New Urban Agenda", which is an integral part of the United Nations Sustainable Development Goals and an action-oriented document serving to set global standards for the sustainable development of future cities[1]. The document calls for

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urban planning that is "people-oriented" and "shared by all", thus provides a good opportunity for the implementation of the Child Friendly Cities Initiative which stresses children's vulnerability in the urban environment and meeting children's needs to plan the urban environment on the basis children's rights and promote sustainable urban development.

In 2018, under the framework of the United Nations Sustainable Development Goals (SDGs) and the "New Urban Agenda", the guiding document by UNICEF titled Shaping Urbanization for Children: A Handbook on Child-Responsive Urban Planning identified 5 major objectives of "health, safety, prosperity, environment and citizenship", which are highly consistent with the SDGs and the New Urban Agenda[2]. In particular, they align well with SDG 11 "Sustainable Cities and Communities", emphasizing cities as the core of sustainable development, and fully demonstrating the importance of urban planning in creating a healthy, safe, inclusive, green and prosperous urban environment for all citizens, especially children [3]. This shows that the development of child-friendly cities also provides indirect support for the local implementation of the United Nations Sustainable Development Goals.

1.2 Guiding actions: "A Handbook on Child-Responsive Urban Planning"

Childhood is an important period for children to integrate into the city and enjoy amenities of the city. Friendly urban spatial environment provides an opportunity for the city to respect children's rights and create equitable spaces. However, the reality is that while urban development has created various opportunities and great prosperity, the uneven development of urban spatial environment also causes potential harm to urban residents, especially children, the most vulnerable group.

Keenly aware of the decisive role of a friendly urban spatial environment on the development of children, the "Handbook on Child-Responsive Urban Planning" issued by UNICEF in 2018 takes the perspective of urban environment, identifies the development goals, and formulates the research procedures for the planning of child-friendly cities on the three spatial scales of city-street-community to illustrate the spatial elements of child-friendly cities. The Handbook advocates a "people-oriented" urban planning approach which ensures that the development of the city takes into account children's behavioral characteristics and actual needs, and facilitates the health, practicality and barrier-freeness of the urban spatial environment. The handbook also proposes three specific measures to facilitate the building of a child-friendly city environment, including urban planning at multiple spatial scales, participation of children and other stakeholders, and the use of urban data platforms such as the geographic and spatial information systems [4].

1.3 Summary

The global efforts of the United Nations on child-friendly cities not only provides planning objective and theoretical methods for the development of the urban spatial environment of child-friendly cities, but also provides effective references for those involved in the planning, design, renewal, construction and management of the spatial environment. Given the different development stages of each country and city, there are surely objective differences in the approaches and steps of the development of specific urban spatial environment. Therefore, in their respective practices of creating child-friendly cities and the planning and making of specific child-friendly city spaces, cities should localize and translate the guiding principles of the various documents officially issued by the United Nations. By aligning these principles with the city's own characteristics and development stages, selecting appropriate benchmark cities and drawing upon their best practices, cities can then carry out the building of child-friendly cities with distinctive local characteristics.

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2. Experience and insights of the development of child-friendly cities at home and abroad

2.1.Selecting benchmark cities for Wuhan

As of 2020, the Child Friendly Cities Initiative has reached more than 3,000 cities and communities globally, and more than 800 cities around the world have obtained the child-friendly city recognition. According to the UN-Habitat Global City Prosperity Index(CPI) database, cities within the same tier as Wuhan and recognized as child-friendly cities were selected as benchmarks. Further, based on similar characteristics to Wuhan city, such as economic scale, abundant lake resource, and rich human resources, the study selected practical cases of child-friendly spaces in cities such as Copenhagen, Osaka, Toronto, and Singapore as references.
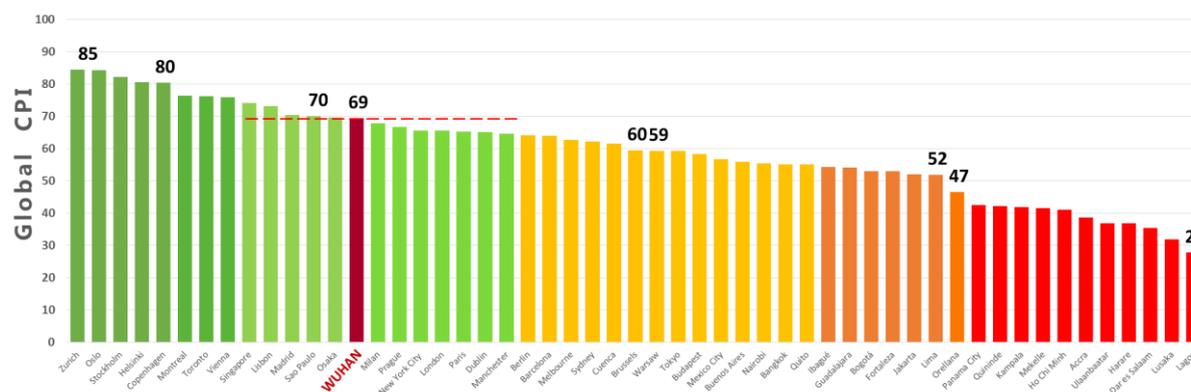

Figure 1. Based on 2018 Global CPI Data, selecting benchmark cities for Wuhan. Source: UN-Habitat Global CPI Database

2.2 Experiences from benchmark urban spaces overseas

These benchmark cities have applied the theoretical research findings into practices of urban spatial environment development and have achieved initial results, mainly in terms of child-friendly communities, streets, public activity spaces, public service facilities, etc. For example, "Growing Up: Planning for Children in New Vertical Communities" compiled by the Toronto City Government in Canada in 2017 offers guidelines for the layout and design of child-friendly spaces in high-density communities [5]; Osaka's "safe road to school" adopts measures such as speed limits, barrier-free design, provision of protective facilities, etc., to ensure the safety of students on their way to school; Copenhagen's "dotted playground" is a multi-level recreational spatial network system for children which constitutes spaces within residential building clusters as the basic units, community and urban public spaces as the backbone, supplemented by other public facilities; Singapore's large public service facilities all provide children's areas and are designed based on the perspective and behavioral characteristics of children of all ages. Singapore's most prestigious case is Changi Airport, which boasts 5 children's play areas, interspersed gardens and themed facilities such as galleries, making the airport a more amicable, interesting, and local "children's playground".

2.3 Spatial development practices of representative cities in China

As one of the 196 signatories of the United Nations Convention on the Rights of the Child, China has actively conducted "child-friendly" practices since the first National Action Program for Promoting Child Development was released in 1992. In response to the "Child Friendly Cities Initiative", the Office of the

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State Council Working Committee on Women and Children drafted the "Objectives and Strategies for the Establishment of Child Friendly Cities in China" in 2010 to raise local governments' awareness of responsibility on administrating children's affairs and making of public policies for child development[6]; China Community Development Association issued the "Child-Friendly Community Development Code" in 2020 to guide and regulate the comprehensive, ecological and sustainable development of child-friendly communities in China. Based on these top-level designs of the state, certain cities have successively proposed to build child-friendly cities and carried out related practices, all of which have achieved remarkable results. The focus of building a "child-friendly city" has also shifted from the friendliness of social environment in the early days to the friendliness of spatial environment. In recent years, cities such as Shenzhen and Changsha have successively formulated special development guidelines and action plans around the building of child-friendly urban environments, and the development of child-friendly cities in China has also advanced rapidly.

Rapid urbanization in past years, while bringing convenience to some urban residents in many aspects, has failed to address the needs for urban services of vulnerable groups, especially children. In recent years, with growing attention on children-related urban spatial problems such as the undersupply of public service facilities, boring public spaces, insufficient slow-moving spaces, and lack of traffic safety, bottom-up children-targeted projects are also increasing in the market, somewhat easing the tension in the demand for urban services for children. Many successful practical experiences have been gained in creating child-friendly urban spaces. For example, "La V-onderland" offers an integrated solution from creative planning to the implementation of children's activity spaces, meeting local conditions and the needs of children of all ages. The public welfare projects run by some social organizations are also well received by the public, which deserves our careful attention and reflection. For example, Playable Design worked with LEGO and initiated the "One Brick One Tile" series of activities in China since 2015, inviting children to build the ideal city in their hearts. Through hands-on activities and practices, children gained professional knowledge on urban planning, infrastructure construction, greening, transportation and their relationship with nature. It also provides children with a platform to have their voices heard, and encourages children to participate in the creation of urban spatial environment.

2.4 Implications for the development of child-friendly spaces in Wuhan

2.4.1 Top-down top-level design guidance: from strategic planning support to action plan implementation

The development of a child-friendly city requires not only the urban spatial environment as the physical carrier, but also a good social environment as a support. Therefore, the spatial planning system of a child-friendly city should be constructed under the overall strategic planning framework of the city, and requires the supports from multiple dimensions including culture, institution, and service. Children's unique psychological and behavioral characteristics at different stages of growth are reflected in the different social and ecological models at various spatial scales such as communities, sub-districts, and cities. Therefore, child-friendly strategies in the spatial environment should start from the top-level design, then realize the multi-scale classification and layout of urban service facilities and public spaces at the corresponding scales.

2.4.2 Bottom-up implementation: from spatial planning guidance to pilot spatial development

At present, there are many children-related projects in the Chinese domestic market, but the overall quality is uneven and some projects are of inferior quality due to outdated philosophy or lack of effective supervision, thus bringing potential dangers to children's health and safety. Therefore, it is urgent to draw on the practical experiences of all parties and formulate effective standards to guide specific projects of

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the planning and development of child-friendly urban spaces. At the same time, children's participation should be incorporated in specific urban planning and development projects by inviting them to participate in the entire planning process, which can help translate children's concerns, opinions and corresponding solutions into technically feasible planning schemes and construction standards, and further promote the implementation of specific projects while ensuring the effects of project implementation [6].

2.4.3 Setting the Wuhan example tailored to local conditions: stressing a global vision and Wuhan characteristics

Shenzhen's development of a child-friendly city starts from attracting talents and building Shenzhen into a modern, international and innovative city. Great attention was given to the top-level design with the coordination of more than 30 governmental departments and institution led by the Municipal Working Committee on Women and Children and the program was implemented from point-like projects to larger areas. Changsha's approach to building a child-friendly city is to enrich theories with practices. The Changsha Municipal Bureau of Natural Resources and Planning led and organized a number of activities on the development of a child-friendly city through planning projects and event planning, thus strengthening the interaction of government departments, schools, enterprises and social organizations, establishing an overall structure for the jointly planned, built, co-governed and shared child-friendly city [7]. As Wuhan City puts forward the ambitious goal of building "five centers" and a modern Great Wuhan, its child-friendly development vision should encompass both Chinese and Western ideas, with a global perspective and local characteristics, so that domestic and international talents can be attracted to the city, settle and thrive here in Wuhan. At the same time, the Covid-19 epidemic in 2020 also provides an opportunity for Wuhan to reflect on the sustainable development of the city, to create a good ecological environment for urban residents especially for children of the city, and to jointly build a more resilient city [8].

3. Wuhan's practices in building a child-friendly city

3.1 Basic characteristics and practical problems

Wuhan has a large child population. Statistics in the past five years show that the total number of children has been steadily on the rise. As of 2018, the number of registered children aged 0-18 in the city was 1.478 million, accounting for 16.7% of the total population. At the same time, Wuhan enjoys rich ecological resources with a natural spatial pattern of large rivers and hundreds of lakes rare in the world. It is also the birthplace of the Yangtze River civilization with various museum clusters, historical and cultural districts, and historical streets. All in all, Wuhan is well-endowed with superb natural ecology, and a plethora of historical and cultural spaces. Entering the era of stock planning, children's spaces are facing problems such as insufficiency of refined design, untargeted design standards. As a result, the activity spaces are generally adult-oriented, repetitive, plastic, and lack of supervision and maintenance.

3.2 Stressing top-level design to build a spatial circle-layer planning system led by strategic planning

The planning objective is to "forge a refined Wuhan, build a safe, equitable, healthy, interesting, child-friendly city oriented towards innovation-led growth, sustainable and prosperous development of children". Supported by the nine modules proposed by Building Child Friendly Cities: A framework for Action at the environmental level, and starting with the five spatial goals proposed by "A Handbook on Child-Responsive Urban Planning" at the urban environmental level, we strive to build a strategic planning system of "four friendlies", namely culture-friendly, institution-friendly, service-friendly and space-friendly.

Children's particular psychological and behavioral characteristics at different stages of development have created different social and ecological models at various spatial scales such as community, sub-district, and

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the city. Therefore, child-friendly strategies in the spatial environment should be classified and laid out at multiple scales, and provide appropriate urban service facilities and public spaces for children accordingly at each specific scale [4]. Based on children's real needs and behavioral characteristics, and backed by the public park system of country parks, urban parks and community parks, the plan proposed a three-tiered spatial circle-layer system of child-friendly activity spaces at the "city/district - sub-district - community" levels, creating the 5-minute walking circle for community living, 10-15-minute circle of public activity for sub-districts, and the 60-minute circle of natural experience. Using various "spatial types" categorized by children's real needs as the physical carrier, child-friendly spaces are divided into four types: urban recreational space, street activity space, community socializing space, and public service facilities. They serve as urban recreational spaces for children to return to nature and emancipate their own nature, offer safe pedestrian environments and interesting street activity spaces, create vibrant and friendly community spaces for socializing; and provide sufficient, diverse, affordable, and friendly public service facilities for children.

3.3 Strengthening space guidance and proposing guidelines for child-friendly spatial strategies, planning and construction

The planning is guided by both problems and objectives, and proposes a child-friendly spatial upgrading strategy based on the characteristics of Wuhan. By sorting out the requirements for children's space planning in relevant regulations and technical standards, based on the goal of making them "safe and comfortable, healthy and green, vibrant and interesting", and in accordance with the principle of full coverage and all elements, the four typical kinds of children's activity spaces, namely urban recreational space, street activity space, community socializing space, and public service facilities, are further subdivided into spatial elements. Furthermore, the planning and construction standards and requirements for these various elements are clarified and compiled into a spatial planning and construction guide that "combines regulatory and recommendatory principles" is formed to guide the planning, design and implementation of pilot projects.

Space Classification	Element category	Element subcategory	
		Regulatory	**Recommendatory**
Community socializing space	Outdoor Children's playground in community	Spatial layout, standard of construction	Space type, activity facilities, landscape environment, vertical interface, signage system, other supporting facilities
	Community service facility	Spatial layout, standard of construction	Service type, construction guideline
	Travel path	Path selection, path width	Path type, environmental facilities, identification system, other supporting facilities
Public facilities	Cultural facilities	Outdoor activity space	Spatial layout, children's flow
	Medical Facilities	—	Relevant construction guideline
	Sports facilities	—	Relevant construction guideline
	Educational facilities	External environment	Internal environment

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	Transportation Facilities	—	Relevant construction guideline
	Other service facilities	Mother and baby room, children's bathroom	Science and education exhibition, rest facilities, stroller parking and renting, water fountain
Urban recreational space	Activity site	Site scale, site layout	Site facilities, site paving
	Park Road System	—	Park road organization, park road paving
	Landscape environment	—	Terrain design, lawn design, water body design
	Planting configuration	—	Relevant construction guideline
	Landscape Architecture	—	Relevant construction guideline
Street activity space	Pedestrian space	Sidewalks, pedestrian crossing facilities	Relevant construction guideline
	Cycling space	Bicycle lanes, bicycle crossing facilities	Bicycle parking facilities
	Activity space	Building front area	Street micro public space
	Motor vehicle traffic management	Traffic calming measures, entrance and exit traffic management	On-street parking management, bus stops

Figure 1. Regulatory and recommendatory spatial elements classification. Source: Author.

3.4 Emphasizing pilot projects and actively promoting child-friendly community planning

Integrating with Wuhan's old community renewal program, pilot communities are selected for the planning of child-friendly communities. Following the basic procedure of "current status survey - evaluation and analysis - planning strategies", based on the different types of spaces and children's activity habits in the community, guided by the overall goal of improving the child-friendly qualities of communities and supplemented by the "Child-Friendly Community Development Code" issued by the China Community Development Association as well as the "Spatial Planning Technical Guidelines for the Development of Child-Friendly City in Wuhan", planning schemes for the pilot communities are formulated, and targeted strategies for the optimization and promotion of different types of spaces and paths are further proposed.

3.5 Strengthening children's participation and listening to voices of children of all ages

The philosophy of a child-friendly city not only requires that the planning and development of the city should take children's needs as the top priority, but also demands the direct participation of children in urban planning and development. In the specific practices in Wuhan city, the planning authority built an effective platform to collect the input of children, and introduced children's opinions in the process of project planning and design, thus facilitating children's participation in the whole process; through issuing the "Questionnaire on the Development of a Child-Friendly City (CFC) in Wuhan", a research report was formulated on the status quo of child-friendly spaces in the city; through activities including a children's painting exhibition and public speech event titled "Painting the City, Painting the Future", planners' presentations and communications on school campus, the planning team helped deepen children's understanding of related concepts and guided them in a lively atmosphere to express their perception of

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the city in real live as well as their imaginations of the ideal city. Through children's participation, the team fully absorbed children's concerns and opinions, put forward corresponding solutions, thus further promoted the human-oriented implementation of specific projects.

Figure 2. 'Painting the City, Painting the Future'event in Wuhan. Source: Author.

4. Prospects and reflections

The Covid-19 pandemic in 2020 made people yearn for more high-quality outdoor public space. The need accords well with the "New Urban Agenda" which advocates the rights of people in the city, equal access and enjoyment of amenities, sustainable cities and human settlements. Child-friendly cities are committed to creating a safe, healthy, interesting and high-quality children's spatial environment. Children's space is the core carrier of a child-friendly city. However, the author believes that as a child-friendly city is a complex giant system, to successfully build Wuhan into a child-friendly city, we need to consider not only how to create child-friendly spaces, but also how to raise child-friendly awareness, coordinate departmental efforts, formulate action plans, engage children's participation, and guide with planning. Through these explorations and practices in the cultural, service and institutional domains, we strive to find a development path suitable for Wuhan's actual conditions.

4.1 Strengthen the promotion of child-friendly concepts

Caring for children represents the care over the whole society. We should pay special attention to the most marginalized and disadvantaged groups of children aged 0-18, call on families and the society to respect children's rights to subsistence and development, their rights to having protection and participation; we should recognize children's propensity for adventure, curiosity, and contact with nature. Through extensive publicity and training, we aim to raise awareness for building a child-friendly city, mobilize the participation of all social sectors, and achieve effective social supervision.

4.2 Form a multi-level and multi-sector collaborative mechanism

As building a child-friendly city contributes to the well-being of the entire population, its implementation requires collective wisdom. The government advocates and mobilizes the participation of all social sectors by clearly identifying the leading and coordinating departments, engaging the joint efforts of government institutions of urban planning, women's federation, education, landscaping, civil affairs, development and reform, communication, as well as other social forces. In general, it has a multi-level city-district-sub-district-community structure, and at the same time encourages multi-sector participation form all social organizations and various walks of life.

4.3 Formulate action plans under the guidance of strategic planning

Guided by the strategic planning and coordinating with the 14th Five-Year Plan for Children's Development and the urban construction plans of at the district level, the inventories of key construction projects of various districts and relevant departments are to be formulated. Additionally, the assessment mechanism for project implementation will also be established to promote the smooth implementation of the action plan. For example, Changsha proposed the Three-Year Action Plan (2018-2020) for Building a "Child-Friendly City" in 2019. Focusing on the three aspects of friendly policy, friendly space and friendly service, it put forward 10 major actions and 42 tasks to execute the child-friendly city strategy from top-level planning, pilot demonstration, standard setting, and gradual promotion, facilitating the building of Changsha into a child-friendly city in an all-round way.

4.4 Advocate more in-depth forms of children's participation

Children are the most important target group in building a child-friendly city. How to see the city from a one-meter-tall perspective? How to truly listen to Children's voices and adopt their opinions? Answering these questions requires collective wisdom. During the "Painting the City, Painting the Future" activity in Wuhan, the author has indeed noticed that some children are overburdened with school work and participate in the activity only out of utilitarian purposes. How to achieve a more in-depth and advanced level in children's participation and avoid the utilitarian, purposeful, or formal approaches to children's participation is of particular significance as only in this way can we fulfill children's rights and facilitate their healthy development.

4.5 Issue guidelines and instructions for the planning and development of child-friendly spaces

It is recommended that the planning and development guidelines for child-friendly spaces should be formulated to provide instructions or regulations for the making of child-friendly spaces and serve as the basis for joint compliance in the planning and design of child-friendly urban spaces. At the same time, the core and mandatory elements in the guidelines should be incorporated into planning prerequisites which will be used as the criteria in subsequent construction and management reviews. Moreover, the author calls for the launching of a design management alliance and the establishment of a joint project review and acceptance mechanism to jointly guide the refined design and management of the four major types of spaces, and realize the integration of planning formulation and management.

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