

highlights how the principles of greening and circular resource use in the Minawao refugee camp have helped to maintain a balance between protection of the local ecological environment and promoting sustainable livelihoods, improving the community's ecological resilience and long-term prosperity. The case of Yokohama in Japan focuses on the city's piloting of blue marine resource use and carbon fixation to conduct experimentation into achieving carbon neutrality, as well as the city's use of an innovative carbon credit mechanism and carbon offset trials. Lastly, the case of Dar es Salaam in Tanzania exemplifies the value of Big Data in which, via the Rumani Huria project community-driven flood mapping, vulnerability assessment and early warning system integration has helped to bolster resilience in the city's most vulnerable communities.

Case Studies

Weihai, China: Building an Exquisite Green City

Case background³

From many years, multiple cities in China have been exploring paths towards sustainable urban planning and green development. A key objective of city managers has been to achieve sustainable urban social and economic development alongside the protection of blue sea and sky, green mountains and clear waters offering urban residents a sense of satisfaction and happiness. This aligns with the principle that a city should not only consist of cold, tall reinforced concrete buildings but also greenness and warmth imbuing residents with a sense of identity and belonging. Situated in northern China, Weihai city has, through years of development, become an exquisite city of great warmth. Weihai is located at the eastern end of the Shandong peninsula. With the Yellow Sea to the north, east and south the peninsula covers 5,800 km² spanning 135 km from east to west and 81 km north to south, with a total of 985.9 km of coastline and a population close to 3 million.

Multiple factors are involved in the construction of an exquisite city; however, this section will focus on greenness and warmth. During his visit to Weihai in

2018, Chinese President Xi Jinping proposed that Weihai should aim to develop into an exquisite city, advocating for the city's sustainable development. Over the past five years, the exquisite city concept has guided all aspects of Weihai's politics, economy, culture, society and ecological civilization at the institutional design level, as the city has strived to manage the relationships between its construction as an exquisite city, economic development, rural revitalization, ecological environment and maritime development, visibility and other important areas. At the implementation level, Weihai has stressed the importance of appropriate planning, meticulous design and construction, precision in management and services, and smart growth in order to improve the city's quality and content, creating a model city. In 2020, the city promulgated the 'Regulations on building an exquisite city in Weihai' which were designed to support and promote the construction and development of a city of the highest-quality and improve the quality of life for urban residents.

Weihai has valued the creation of distinctive urban characteristics and the appearance of that of an 'exquisite human habitat between magnificent mountains and sea' to cater for its new era. Refining the six elements of its cityscape, mountains, water, sea, city, bay and islands, it has maintained excellent natural spaces, particularly between the mountains and the sea, providing citizens with a green liveable city that they can explore, feel and experience, as shown in Figure 4.1. Since beginning its construction

³ Many thanks to the Weihai Refined City Construction Office, the Bureau of Commerce, the Marine Development Bureau, the Ecological Environment Bureau, Tongji University, the Shanghai Academy of Social Sciences, the Shanghai Society for Sustainable Development, and other departments for their strong support on this case.



Source: Weihai Tourism Development Commission. URL: <http://wjj.weihai.gov.cn/> (Accessed: 20/06/2022)

Figure 4.1 Weihai lighthouse and surrounding high-quality green space

as an exquisite city, Weihai had established itself as the first pilot city of the Beautiful Cities programme, and in 2020 and 2021 was awarded the title of China's Happiest City. As its urban functions have improved, the happiness and satisfaction of local inhabitants have also increased. During its construction, Weihai carried out a series of innovative explorations thereby accumulating a unique 'Weihai experience' of referential significance.

Implementation process

Weihai has developed many innovative practices and accumulated valuable experience across the fields of social, economic, environmental, cultural development and urban governance. Via a strategy of 'urban greening' Weihai has integrated green infrastructure to create a sense of warmth in the city, increasing not only the attractiveness of the landscape but its sustainability and functionality.

1. Connect residents and green space through the use of pocket parks

The term 'small street garden' or 'pocket park' refers to green spaces created on small or irregularly-shaped independent plots of land. Offering functional space for recreation, these parks are highly accessible to local residents. Scattered around the city, pocket parks not only enhance the urban visual appearance but add interest to the life of Weihai's inhabitants and are thus highly popular features. The parks play an important role in enriching the quality of life with healthy leisure spaces, enhancing the urban environment, improving the functionality of urban spaces and promoting urban

restoration. Weihai adopted a garden design concept for pocket parks, envisioning 'blooming flowers in three seasons and bright colours in all four', alongside the concept of creating ecological sponges which enable water seepage, storage, retention, purification, use and discharge. In efforts to harmonize design with local conditions, the city has sought to better integrate pocket parks by promoting a variety of forms, reasonable layouts, useful functionality, ecological beauty, safety and comfort in order to emphasize the characteristics of 'exquisite city, happy Weihai' into its urban landscape (see Figure 4.2).



Source: Weihai Daily. URL: <https://www.whnews.cn/> (2021) (Accessed: 21/06/2022)

Figure 4.2 Zhongxing Youyuan pocket park in Weihai

The construction of pocket parks commenced in 2017. In March of that year, the Municipal Bureau of Housing and Urban-Rural Development together with the Municipal Bureau of Finance issued the Opinions on Strengthening the Construction and Management of Urban Small Street Gardens (WZJTZ [2017] No. 21). Subsequently in December, the two bureaus jointly issued the Regulations on Subsidies for Excellent Small Street Garden Construction Projects in Weihai (WCY [2017] No. 98). These two documents require that bodies constructing 'excellent small street gardens' involving large investments, high technical capacity and significant ecological benefit should be subsidized appropriately. The construction and management standards for Weihai's small street gardens includes pocket parks. In 2018 and 2019, the standards for planning and design, engineering construction, plant configuration, service facilities and maintenance management were further refined, and Construction Standards and Scoring Standards for Exquisite Pocket

Parks formulated. The 2020 technical guidelines for the construction and management of Weihai's small

street gardens offers a guide for the construction of pocket parks in the city (see Table 4.1) Today, Weihai's

Table 4.1 The overall design rules for Weihai's small street gardens

Clause	Content
Basic Requirements	<ol style="list-style-type: none"> 1. Site selection of small street gardens should conform to requirements for land use planning, including overall urban and rural planning, and for green space system planning in order to ensure that the relationship with urban construction is properly handled 2. The designs of small street gardens should be based on investigation and evaluation of the current situation and the surrounding environment, coordinate with the surrounding cityscape and functions, and take the protection and development of unique local culture and landscapes into account 3. Gardens' functional zoning, landscape layout, path system, planting design, architecture, ornaments, engineering pipelines and other features should be designed as a whole in accordance with varying construction requirements 4. The designs of small street gardens should be people-oriented, functional, safe, comfortable, ecological and beautiful, and offer good spaces for activities, recreation and viewing 5. The main entrances and exits, main roads, important landscape nodes and buildings of small street gardens should feature accessible design and accessible facilities, and should comply with the provisions of current national standard Codes for Accessibility Design (GB 50763)
Site Handling	<ol style="list-style-type: none"> 1. The design of small street gardens should be based on analysis of the local environment, surrounding businesses, users, natural environmental conditions, historical and cultural conditions, traffic conditions and utilities around the proposed site. The current topography, waterways, buildings, vegetation resources, above-ground or underground pipelines and engineering facilities within the design scope should be investigated, evaluated, dealt with and records filed 2. Land used for a small street garden should not pose a risk of potential pollution. Where a pollution risk could exist, safe and appropriate technical measures should be taken to eliminate it in accordance with the results of the environmental impact assessment 3. Valuable garden buildings or garden ornaments (if any) within the design scope should be protected and integrated into the landscape design of small street gardens 4. Ancient/famous trees (if any) within the design scope of small street gardens should not be cut down or transplanted, and protective measures should be taken. Pre-existing healthy trees, shrubs and creepers should be retained and utilized as much as is reasonably possible 5. For designs near existing underground pipelines or engineering facilities, protection measures and construction requirements relating to these pre-existing objects should be proposed
Overall Layout	<ol style="list-style-type: none"> 1. The overall layout should coordinate the current conditions and characteristics of the site with the functions, facilities and landscape of the small street garden 2. Functional zones should be reasonably divided, with the size and layout of each zone determined based upon the scale of the site, functional requirements and landscape characteristics 3. Site topography should be reasonable in form and have a basis in functional requirements such as landscaping, spatial organization, and rainwater control and utilization 4. The layout of garden path systems should determine the locations and sizes of entrances/exits, the routes and hierarchy of paths, and locations and forms of paved areas in accordance with the garden's scale, zoning and management needs. Garden paths and paved areas should be coordinated with the design theme in style and function 5. Planting design and plant configuration should be determined taking into account site conditions, landscape conceptions, functional requirements and local residents' viewing habits. Local plants should dominate in adherence with the concept of 'blooming flowers in three seasons, bright colours in all four' to create plant landscapes with diverse community structures and richly varied views 6. The style, location, volume and spatial layout of garden architecture and garden ornaments, as well as their coordination with garden paths and paved areas, should be determined in accordance with functionality, landscaping requirements and municipal utility conditions 7. Electrical, water supply, drainage and communication engineering installations, along with other supporting facilities of small street gardens, should be visually beautified while meeting technical specifications, reducing visual pollution 8. Small street gardens' emergency evacuation functions and arrangements for the corresponding facilities should be determined based on Weihai's comprehensive disaster prevention and reduction planning in terms of scale and safety conditions

245 pocket parks have greatly reduced the distance between local residents and green spaces.

2. Returning aquaculture ponds to the sea: coastal zone environmental restoration and coastal footpath construction

Weihai has carried out a phased, zone-based comprehensive renovation and restoration of its shoreline in recent years, and has completed the expropriation and relocation of coastal aquaculture ponds, the ecological restoration of shorelines, and the construction and improvement of coastal footpaths. A number of key areas have been renovated and restored including the Shuangdao Bay Coastal Zone Renovation and Restoration Project (in which approximately 7.3 km of aquaculture pond cofferdams were demolished and approximately 1.5 km of ecological revetments newly built); the Shuangdao Bay Blue Bay Project (in which approximately 3 km of shoreline has been restored, 100,000 m³ of marine waste cleared and 250,000 m³ of aquaculture ponds demolished); as well as the Rongcheng Chengshan Town Malan Bay Shoreline Renovation and Restoration Project (where 4.4 km of revetments have been newly built, 15,000,000 m³ of earthworks and waste cleared, 76,000 m³ of structures demolished, 36,000 m² of beach restored and 119,000 m² of vegetation restored). In addition, the Rushan Langnuankou-Heshangdong coastal zone Protection and Restoration Project has restored 3 km of sandy shore and 1.4 km of reef shore, and constructed 158 m of ecological seawall, whilst a total of 14 km of coastline along the eastern section of the Binhai New City was comprehensively renovated and restored achieving the goal of marine ecological civilization construction: 'clear water, green shores, clean beaches and beautiful bays'. In the western urban district from Yuehai Park to Haibu Road, a 20 km stretch of coastal footpath has been constructed offering the public a continuous, green space that serves as a shared leisure venue whilst promoting ecological health.

Following the reconnection of aquaculture ponds to the sea, the city has also worked to reconnect local citizens and urban life to the sea, actively improving public service facilities in coastal green spaces, constructing footpaths along the shoreline, and

creating coastal walking experience zones and routes with natural scenery designed to allow citizens the experience of 'facing the sea, feeling spring come and flowers blossom'. Details attest to the degree of effort that the city has exerted in its incorporation of these design concepts into every corner, project and action during implementation (see Figure 4.3). Huancui district's Haiyuan Park renovation project, the Oil Painting Town Fashion Sports Park renovation project, the Huanhai road sea viewing platform and the Banyue Bay landscape improvement project have all been completed in the last two years.



Source: Weihai Tourism Development Commission

Figure 4.3 Weihai Park

A number of footpath renovation and improvement projects have also been completed including those in Shuangdao Bay, Gaoqu District (2.7 km of footpath); Rongcheng City's Jinshiwang Art Park and Hutoujiao (0.51 km of footpath); Xiaowudui rental vehicle (RV) Camp (1.6 km of footpath/greenway); Chunfeng Coast to Wanguocheng South Line (1.2 km of greenway); Rongchengwan (9.91 km of footpath); and Rongli Road (5.59 km of footpath) totalling 18.81 km of new footpaths and greenways. In addition, 2.05 km of footpaths along Chaoyanggang bridge, the coastal park and the seaport have been developed using a permeable concrete construction, as well as the foundations of a 1.5 km greenway from Shuangbangzi to Hekou Wharf. In the Xiaowudui RV Camp area, facilities such as the Diamond Wedding Square, beach tents, an infinity swimming pool, 32 RV yards and 4,500 m² of ecological parking lots have been integrated.

Reference experiences

1. Understand the value of Weihai's three-in-one (legal, indicator index and standards systems) top-level design in the creation of an 'exquisite city'

Legal system developments and improvements played a key role in Weihai's transformation. Since obtaining local legislative power in 2015, Weihai has formulated nine sets of local laws and regulations including four related to urban and ecological civilization construction predominantly involving cityscape protection, water source and coastal zone protection, and hazardous waste management. In 2018, the city initiated the formulation of China's first regulations for an exquisite city – Regulations on Construction of an Exquisite City in Weihai. The Regulations came into force in November 2020 and set out general rules for urban construction from the perspective of urban planning and design, construction management and service guarantees, providing a legal basis for urban examination and an evaluation system, guiding the development of the city's vision. The development of an outline indicator index system also served as a key mechanism in driving Weihai's green development. In 2019, the city issued a three-year action plan for exquisite city construction, laying out a roadmap in the form of 385 exquisite city construction projects and 68 annual key demonstration projects. Refinements made to the standard system and pilot planning also aided design in Weihai.

The Weihai Exquisite City Evaluation Index System sets out 50 indexes covering 5 themes (the ecological environment, urban characteristics, public services, development momentum and social governance) along with target values for 2025 and 2035. The document provides a quantified answer to the question, 'What makes an exquisite city?', rendering every work programme quantifiable and implementable. A series of technical guidelines have been compiled for each stage of urban planning and construction management including comprehensive road renovation, greenway construction, construction and management of small street gardens, and landscaping maintenance. Stricter and more detailed than the national norms, these guidelines are ensuring refined, meticulous execution at all stages in the entire urban construction and management process. Preparation of the city's

first 'physical examination' report which includes 85 indexes covering 8 themes (ecological livability, health and comfort, safety and resilience, transportation convenience, cityscape features, neatness and orderliness, diversity and tolerance, and vitality of innovation) was entrusted to a professional third-party team. The underlying problems detected have not only become the priorities of the Housing and Urban-Rural Development Department but were also reported to the Natural Resources, Planning and other departments in order to guide improvements in the relevant top-level design.

2. Focus on content and quality and ensure development in line with sustainable planning principles

In the construction of an exquisite city, Weihai has attached great importance to the improvement of both content and quality, advocating intensive land use and creating a more compact, efficient and sustainable urban model, increasing the dynamism, liveability and recognition of the city. Based on the blueprint 'mountains in the city, city in the ocean', the city has aimed to construct Weihai as a 'big scenic area' without boundaries. First, it promoted full urban design coverage, and as early as 2017 the city began to explore state-of-the-art urban design methods, transforming two-dimensional urban design data provided by the central city's 16 management areas and 63 management units into three-dimensional models, achieving an integrated compilation of urban planning. Designing each area and building from the perspective of an artist, the city has carefully created elements such as themed streets, landscaping, landscape lighting, street interfaces and urban sculptures, and initiated construction of the Seaport Park, Jinxianding Park and coastal footpaths in order to create Weihai's distinctive 'painting style' coastal landscape.

Weihai has continuously carried out comprehensive improvement of the environment along its 'three lines' – the mountains, coast and railway. Altogether, 141 km of coastal ecological footpaths have been completed incorporating events, consumption and other functions while maximizing the protection of beaches, reefs, pine forests and other ecological components, ensuring they are kept in a natural state with minimal traces

of artificiality. A 22.6 km greening project along the mountain view line has been completed using diversified varieties, colours and layers of plants matching and coordinating with trees, shrubs, flowers and lawns to ensure a natural appearance. In addition, reflecting the city's adherence to green, low-carbon development, sponge city construction requirements were incorporated into project construction stages including construction drawing design and review in projects including old residential area renovations and pocket parks construction. Over 25 percent of urban built-up areas have achieved relevant planning and design values, fulfilling the goal of 'no ponding in light rain, no waterlogging in heavy rain'. The city integrated green, low-carbon concepts in the development of its construction industry developing safe, energy-efficient, green and prefabricated buildings, and promoted the application of prefabricated concrete and other environmentally friendly materials as well as green building standards in all new buildings in the city planning area. This resulted in Weihei's inclusion in the first batch of green city demonstration projects of China's Ministry of Housing and Urban-Rural Development, and recognition as a model green city.

3. Understand the value of Weihei's 'exquisite governance' model based on operated measures and innovation

Weihai was the first national-level Sanitary City, and a recipient of honorary awards such as the UN-Habitat Scroll of Honour Award and the China Environmental Protection Award. In addition, it was approved as the only pilot 'Waste-Free City' and 'Beautiful City' in the Shandong province. Over the years, Weihai has prioritized ecology in regard to its economic and social development, cherishing the city's 'blue and green' backdrop. The city has long adhered to a system of 'four maximums': the strictest environmental supervision; most active ecological

construction and intensive resource utilization; and the most stringent responsibility assessment. With dozens of berths in excess of 10,000 tons and many deep-water ports, Weihai is well-suited to petrochemical, cement and other port-vicinity industries, and has thus attracted many investors; however, none were accepted. In addition to implementing a strict access policy to maintain environmental integrity, Weihai has been earnestly advancing mountain restoration, river management, river and reservoir greening and other environmental action plans, with ecological civilization construction expenditure accounting for 17.3 percent of its general public budget expenditure in recent years. The city's environmental air quality has reached national level II standards for five consecutive years, and 100 percent of its primary drinking water sources and water located in environmental functional zones in immediate offshore areas is compliant with water quality standards. The city has also promoted the ecologicalization of industry, pioneering new business models including ecology and leisure tourism and ecology and cultural creativity to drive average annual tourist growth numbers of 9.3 percent and total tourism revenue of 12.2 percent. In order to further the modernization of Weihai's urban governance capacity and provide citizens with more considerate and satisfactory public services, the city has implemented an innovative mode of social governance incorporating aspects such as grid management, community autonomy, and credit-based measures, ensuring the application of modern ideas and scientific methods to enhance the quality of urban governance. Subject to rapidly increasing digitalization, Weihai has developed the integration of various e-government platforms, construct efficient, convenient and satisfactory service platforms, collect public opinions from multiple channels, create internal linkages between government organizations and handle feedback from individual departments.